News about

B. F. Goodrich Chemical *raw materials*

HYCAR
improves products . . .

HYCAR
advertising improves sales!

THE 3 advertisements above are typical examples showing how parts made of Hycar helped improve products—in the aviation, dairy and petroleum industries.

Advertisements like these aid our customers in improving sales in the fields in which they are interested—and demonstrate how Hycar builds business for Hycar users.

Hycar American rubber has many uses in a broad range of industries. Hycar's advantages—excellent molding characteristics, resistance to oil, gas, extreme temperatures and pressures, abrasion and many chemicals—may help you solve a tough problem or develop a new sales-maker. For information, please write Dept. HB-8, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar
Reg. U.S. Pat. Off.
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

Hot Stuff

Temperatures far above those encountered in any other phase of the rubber industry are responsible for the reinforcing pigments now so widely used.

Philblack* for example, is a product of "pyrolysis" which is chemical decomposition by the action of heat.

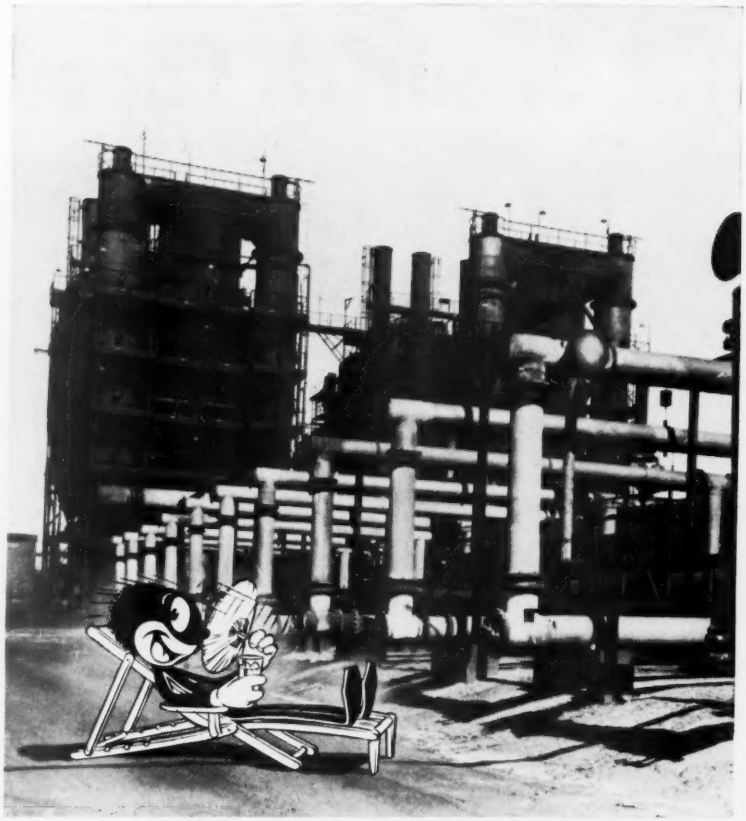
Extremely accurate temperature control is maintained. Philblack oil feed is elevated hundreds of degrees Fahrenheit in a matter of micro-seconds.

The superheated gases are then water-quenched at just the right split-second and gradually cooled further in atmospheric cooling pipes and water spray towers until they are cool enough for bag filters.

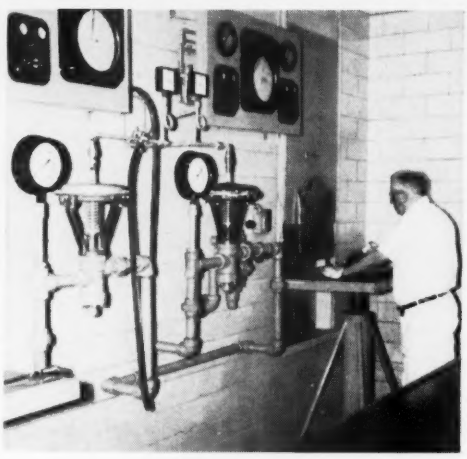
Production samples of Philblack are then regularly submitted in our Customer Service laboratory to carefully controlled temperatures in Banbury mixers and during vulcanization. All of which has given us a fine understanding of the role that heat plays in the ultimate value of Philblacks in your rubber products.

Think of us when you have a "hot" problem in rubber compounding. Our technical staff is fully equipped to assist you in all phases of rubber processing and product evaluation.

*A TRADEMARK



Atmospheric cooling pipes at the world's largest furnace black plant which is operated by Phillips Chemical Company in the Texas Panhandle.



Vulcanizing press at our Akron-Sales-Service Laboratory is used to produce samples for product evaluation. Have any of your products or recipes had the benefit of our testing? Ask your Philblack technical representative for full information.

Know the Philblacks! KNOW WHAT THEY'LL DO FOR YOU!

A **Philblack A FEF Fast Extrusion Furnace**
Ideal for smooth tubing, accurate molding, satiny finish. Mixes easily. High, hot tensile. Disperses heat. Non-staining.

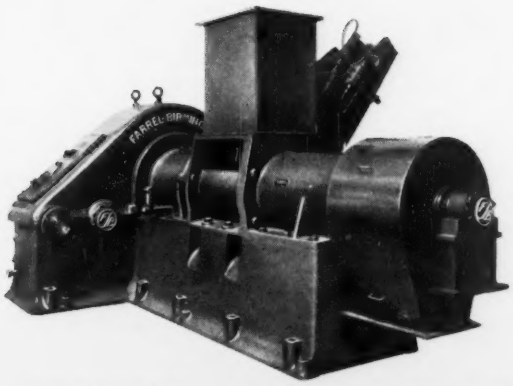
I **Philblack I ISAF Intermediate Super Abrasion Furnace**
Superior abrasion resistance at moderate cost. Very high resistance to cuts and cracks. More tread miles at high speeds.

O **Philblack O HAF High Abrasion Furnace**
For long, durable life. Good electrical conductivity. Excellent flex. Fine dispersion.

E **Philblack E SAF Super Abrasion Furnace**
Toughest black on the market. Extreme abrasion resistance. Withstands aging, cracking, cutting and chipping.

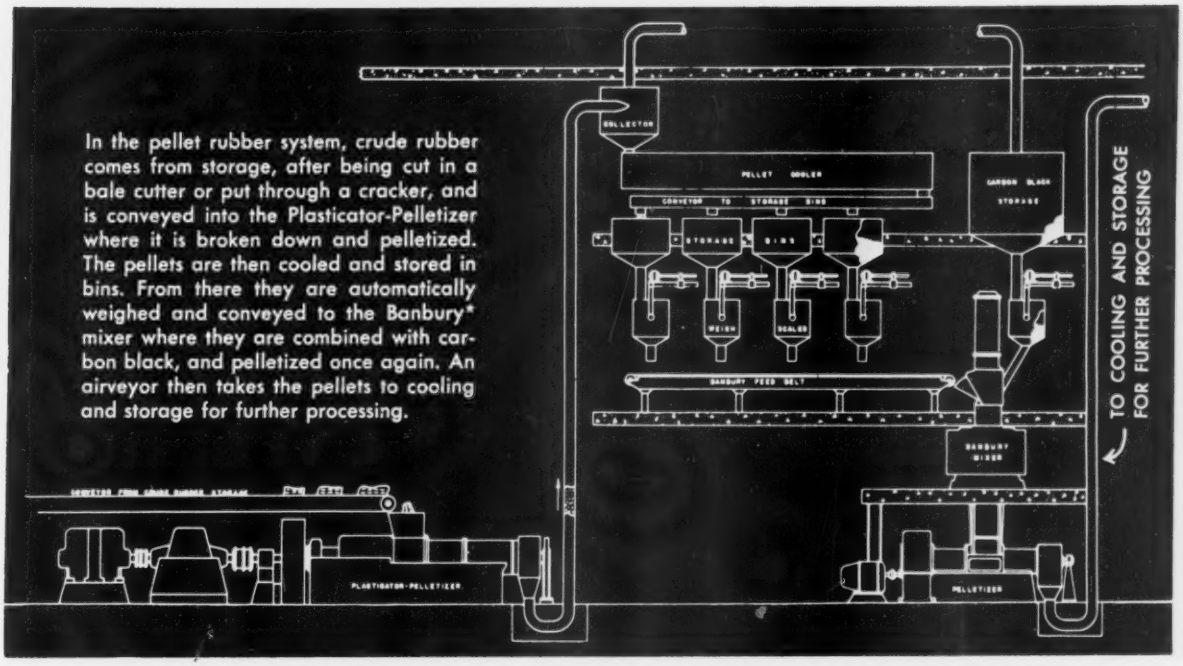
Phillips 66

PHILLIPS CHEMICAL COMPANY, Philblack Sales, 318 Water Street, Akron 8, Ohio. Export Sales: 80 Broadway, New York 5, N. Y. West Coast: Harwick Standard Chemical Company, Los Angeles, California. Canada: H. L. Blachford, Ltd., Montreal and Toronto.



modernize

WITH THE PELLET RUBBER SYSTEM


In the pellet rubber system, crude rubber comes from storage, after being cut in a bale cutter or put through a cracker, and is conveyed into the Plasticator-Pelletizer where it is broken down and pelletized. The pellets are then cooled and stored in bins. From there they are automatically weighed and conveyed to the Banbury* mixer where they are combined with carbon black, and pelletized once again. An airveyor then takes the pellets to cooling and storage for further processing.
COLLECTOR
PELLET COOLER
CONVEYOR TO STORAGE BINS
CARBON BLACK STORAGE
STORAGE BINS
WEIGH
SCALES
BANBURY FEED BELT
BANBURY MIXER
PLASTICATOR-PELLETIZER
PELLETIZER
TO COOLING AND STORAGE FOR FURTHER PROCESSING

By transforming bulky, hard-to-handle rubber into free-flowing pellets, the Pelletizer makes possible modern, high-efficiency mill systems, like the one shown here. Automatic conveying, weighing and mixing cut handling and storage costs. Overhead storage and elimination of trucking reduces required floor space. The mill room is cleaner because the pellet handling system is completely sealed in.

Other advantages you get from the pellet rubber system are:

1 Increased production—Banbury* mixing cycle reduced.

2 Greater ease of mixing and blending rubber pellets improves uniformity and quality of finished product.

3 Pellets cooled quicker, more thoroughly—reduces time between processing operations—less stock in process.

The Pelletizer itself is an extruding machine in which a screw forces the rubber up to the pelletizing head, where the pellets are formed. The pellets are lightly coated, before leaving the machine, with a soapstone solution which prevents sticking together. Besides pelletizing, this machine gives the rubber extra working, which improves plasticity and dispersion.

If you are interested in improving uniformity and quality of your finished product, and at the same time cutting your handling costs send for complete information about the Pelletizer and the pellet rubber system. Write today—no obligation, of course.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

*Trade-mark

FB-913

Farrel-Birmingham®

FINER FLOORING IS MADE FASTER

with new, dry blending PLIOVIC DB80V

FASTER mixing and a shorter heat history are the basic advantages of making flooring with dry blending PLIOVIC DB80V. These, in turn, lead to other benefits in the forms of greater total throughput, better development of cleaner colors, improved heat and light stability, less deterioration of physical properties and longer service life.

PLIOVIC DB80V is a straight polyvinyl chloride resin. But it's tailor-made to provide the properties needed in a good, dry blending resin. It absorbs plasticizer at a rapid, uniform rate. It gives a sandy, free-flowing mix that does not pack or bridge. And it does so with no sacrifice in processing characteristics or physical properties.

PLIOVIC DB80V is no happy accident, but the result of much research and development and carefully controlled production. The secret of its success as a dry blending resin lies in the close control exercised over its particle size, structure and distribution. Particles of DB80V are dry, free-flowing, irregular in surface and remarkably uniform in size.

Three other features of PLIOVIC DB80V which flooring makers find to their liking are its high degree of uniformity, its excellent heat stability and its thorough fluxing. These add up to more capacity on existent equipment and more consistent production with fewer rejects.

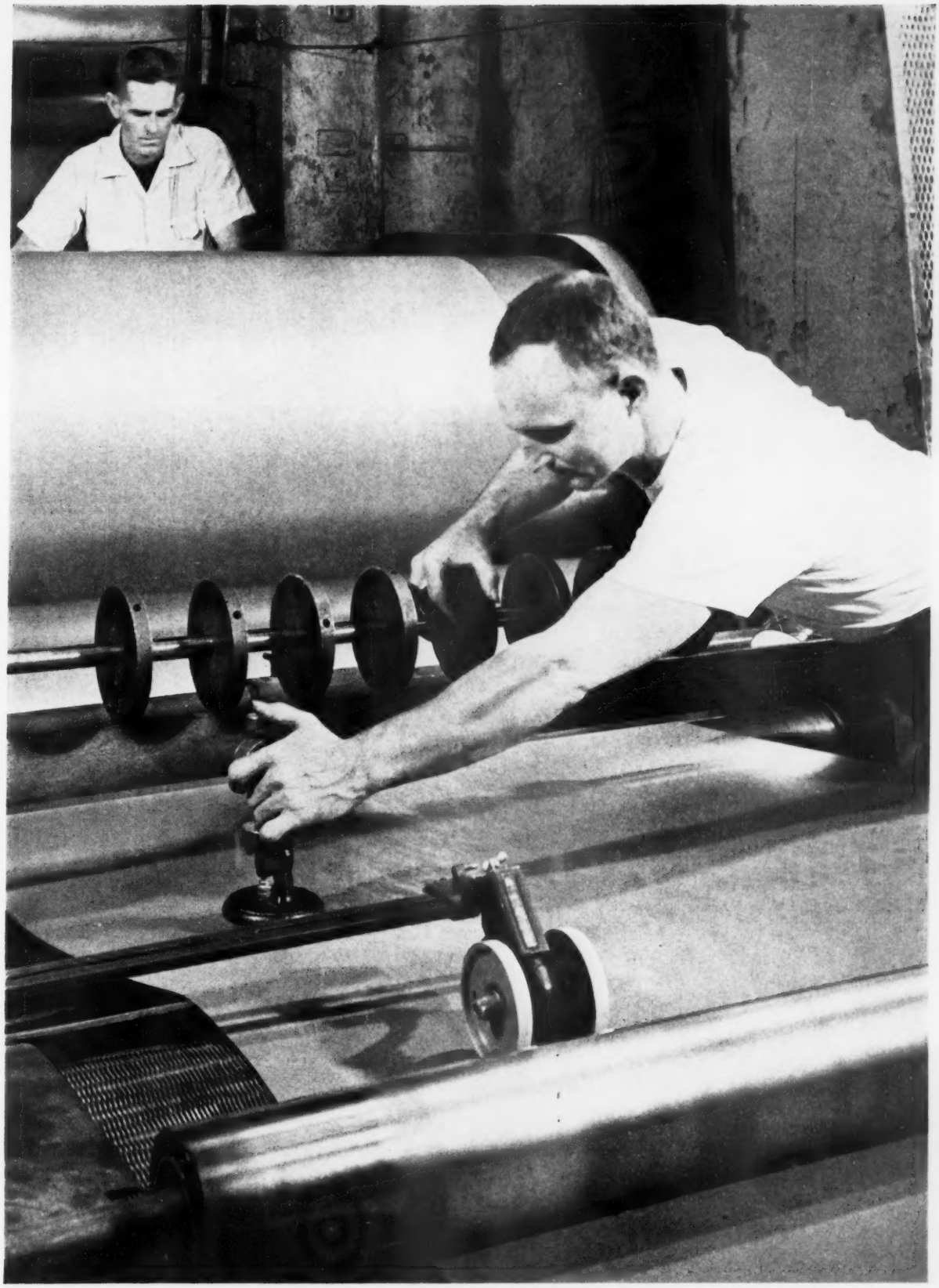
PLIOVIC DB80V is new, but not untried. It has fully proved its mettle in many tests and trial runs and in actual production. Why not let it prove itself in your plant? Samples and technical help are yours for the asking. Just write to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry



TURNING OUT TOP QUALITY flooring is easier, faster, more profitable with PLIOVIC DB80V — the new, dry blending polyvinyl chloride resin.

CARY ANTISUN

Sun Checking Agent

for TIRE COMPOUNDING

CARY ANTISUN is used in substantial quantities in tire compounding, mechanical goods, insulated wire and cable compounds, and other rubber goods. Provides excellent protection against sun-checking at minimum cost.

- Recommended Usage: 2-4% of the weight of the rubber hydrocarbon, depending on the degree of protection desired.
- Unlimited Availability.
- Low cost.
- Available in convenient chipped or slabbed forms.

Write for literature and samples.

Cary Chemicals Inc.

Successors to BURGESS CHEMICAL CO.

Executive Sales Offices: 64 HAMILTON STREET, PATERSON 1, NEW JERSEY

Laboratory & Plant: RYDERS LANE, MILLTOWN, NEW JERSEY

CARY CHEMICALS PRODUCTS:

- Vinyl Compounds
- Vinyl Plasticizers
- Reclaiming Oils
- Sun Checking Agents
- Esters
- Stearine Pitches

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

- **Accuracy to close Tolerances**
- **Durability**
- **Genuine Understanding of the problems of rubber goods manufacturers**

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.

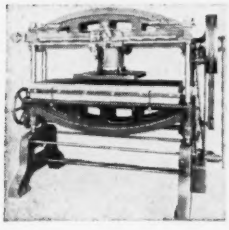
STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.



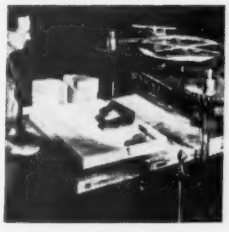
STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.



ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

SERVICE—One to three day service on dies.

Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.

SAME DAY SERVICE

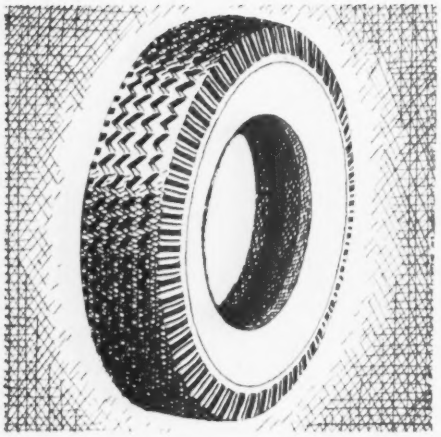
ACCURATE

STEEL RULE DIE MANUFACTURERS

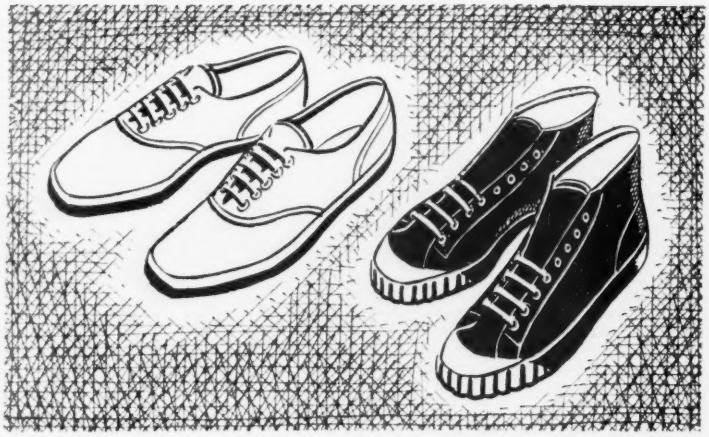
24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 23 Years

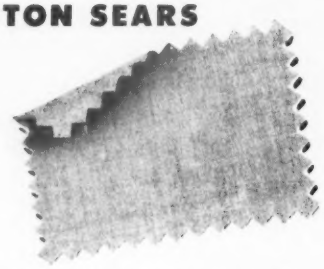


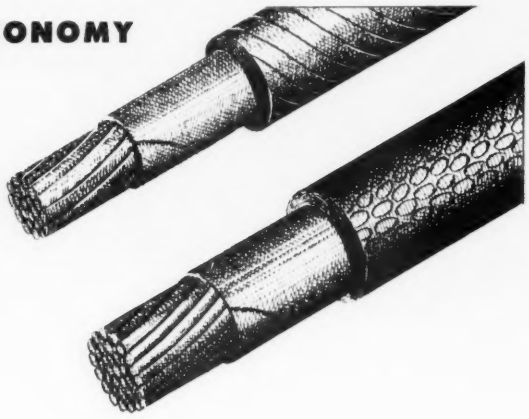
Woven for strength and abrasion resistance, chafer duck is typical of Wellington Sears reinforcing fabrics.



Wellington Sears rubber footwear fabrics include sturdy, economical and easily adhesive enameling duck for tennis and gym shoes and other rubber footwear.

YOU GET UNIFORM QUALITY AND ECONOMY WITH WELLINGTON SEARS COLUMBUS SHEETING





Matching quality, yard after yard, is the basis for Columbus sheeting's long-standing reputation in rubber fabrication. Lightweight and economical, it is carefully woven to yield an absolute minimum of rubberizing process rejects.

These sheetings are made 40 to 120 inches wide in weights from 2 to 5 ounces per square yard. For submarine and other cable wrapping . . . friction tape . . . heavy duty raincoats . . . hospital sheeting . . . Columbus sheeting has versatility to equal its uniformity.

Other cotton, synthetic, and blended fabrics available from Wellington Sears for coating, specialties, and mechanical rubber goods are listed at right. If it's a rubber-and-fabric problem, talk it over with Wellington Sears.

Write for your free copy of "Modern Textiles for Industry" which includes pertinent information on rubber applications. Address: Wellington Sears Co., Dept. 1-6, 65 Worth St., N. Y. 13.

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and plied-yarn chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high tenacity rayon, other synthetics and combinations.

Wellington Sears

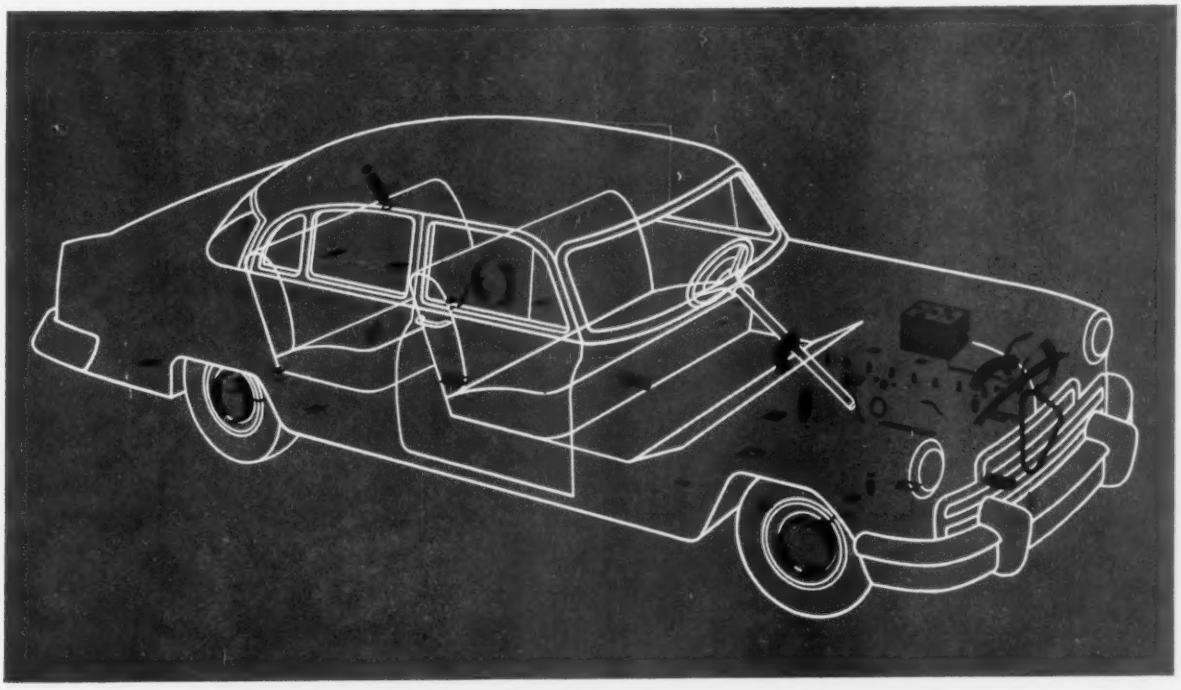
A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

Offices In: Atlanta • Boston • Chicago • Detroit • Los Angeles • New Orleans • Philadelphia • San Francisco • St. Louis

UNDER THE HOOD and throughout the body of the average car, many parts molded or extruded of CHEMIGUM—the easiest-processing oil-resistant rubber—make the wheels turn longer, safer and smoother.



THE RUBBER

that really makes the wheels go round

ASK the average driver about automotive rubber and he'll first mention tires and tubes. Foamed rubber cushioning, floor mats, weather stripping and heater hose probably would be next. Actually there's much more to the role of rubber in automobiles.

All told, there are about 540 parts—238 pounds—of rubber in the average car. Take away the obvious items and there are still close to 500 parts vital to proper operation. Multiply that figure by the millions of units produced each year and you have big business. Tough business, too, since mass producers are so cost- and performance-conscious.

That's why CHEMIGUM—the first and finest nitrile rubber—is so often used to make so many automotive goods. Easier-handling bales, much easier processing, faster sulfurless cures, lower compounding costs, excellent aging and physical properties plus greater resistance to automotive oils and solvents are the reasons for choosing CHEMIGUM. For details write Goodyear, Chemical Division, Akron 16, Ohio.

CHEMICAL
GOODYEAR
DIVISION

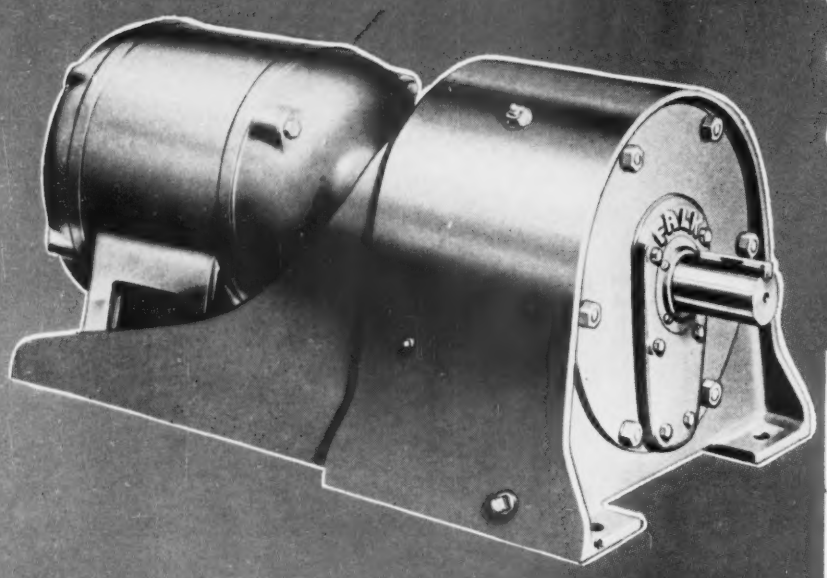
Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

Choose the All-Motor type,

ALL-STEEL FALK Motoreducer

...with complete foot-mounted motor of ANY make ANY type ANY speed



Its exclusive, superior features mean LONG-RANGE ECONOMY!

You get more for your money in a FALK all-steel, All-Motor type Motoreducer. Here is the *only* compact motorized reducer with a separate foot-mounted, resilient Steelflex coupling-connected, standard motor without modifications! It accommodates *any* make, type, or speed of motor within the AGMA rating of the unit. Ratio can be changed within torque capacity of unit without modifying motor.

The simplified construction of the FALK All-Motor type Motoreducer means real long-range economy. Motors or reducer units can be quickly and easily interchanged from one line or plant location to another. Fully standard replacement motors from manufacturers' field stocks are always available without costly delivery delays or special motor or shaft modifications.

When you choose a FALK All-Motor type Motoreducer, you get the utmost in design, versatility of performance, and utility—plus the greatest possible dollar-for-dollar value throughout its traditionally long life... Available in any standard ratio from factory and distributor stocks throughout the country. Write for Bulletin 3104.

FALK ...a good name in industry

THE FALK CORPORATION 3001 W. Canal St. Milwaukee 8, Wis.

Every FALK motoreducer has these "IN-BUILT" FACTORS

1 **All-steel Housings.** Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

2 **Streamlined inside and outside.** Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

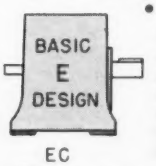
3 **Sealed Housings.** Dual closures and one-way vents keep oil *in*, dust and moisture *out*. Units are splashproof, leakproof, dustproof.

4 **Positive Lubrication.** Large sump capacity ...oil-tight construction assures clean lubricant...direct dip of revolving elements provides positive lubrication at all speeds.

5 **Wide Speed Range.** Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

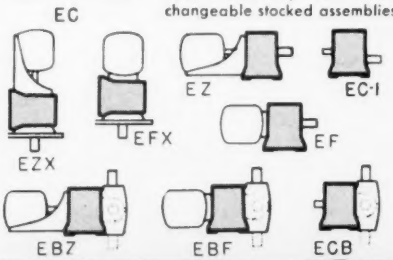
6 **Precision Gearing.** Heat-treated alloy steel, precision cut and shaved helical gearing throughout...quiet-operating crown shaved pinions...taper bored gears for easy ratio changes.

• • •



EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



WRITE FOR BULLETIN 3104

Nerve-Free...

CYCOLAC®

THE *New* HIGH-IMPACT
THERMOPLASTIC RESIN

Never misses the PRODUCTION TARGET

Cycolac is free from nerve or shrinkage; with a high in impact-resistance and heat-distortion temperature plus a low brittle point. Resistant to many oils, solvents and corrosive chemicals. Very light - Sp. Gr. 1.01 . . . dimensionally stable . . . soluble in selected solvents for potential coatings applications. Readily injection-molded.

GET THE FACTS — *Write* TODAY FOR TECHNICAL LITERATURE

Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

MARBON . . . *Precision Resins for Precision Made Products*

Is your product "Under Pressure" too?

Skellysolve for Rubber and Related Industries

Applications

SKELLYSOLVE-B. For making quick-setting cements for the shoe, tape, container, tire and other industries. Quick-drying, with no foreign taste or odor in dried compound. Closed cup flash point about —20°F.

SKELLYSOLVE-C. For making quick-setting cements with a somewhat slower drying rate than those compounded with Skellysolve-B. Closed cup flash point about 13°F.

SKELLYSOLVE-D. For cements and variety of manufacturing operations. Good odor. Quick drying. Minimum of heavy, greasy compounds. Closed cup flash point about 3°F.

SKELLYSOLVE-H. For general use in manufacturing operations and cements, where faster evaporation rate than that of Skellysolve-D is desired. Closed cup flash point about —20°F.

SKELLYSOLVE-V. For use wherever a relatively slow drying solvent is desired. Closed cup flash point about 50°F.

SKELLYSOLVE-R. For general use in tire building and a variety of other manufacturing operations and cements. Reduces evaporation losses. Medium quick final dry. Lessens bloating and skinning tendency. Closed cup flash point about —25°F.

"Doc" MacGEE says: Whatever the nature of your product, it's sure to be "under pressure"—under the pressure of competitive products that are forever bidding for the favor of the customer. Strict quality control is the obvious method of keeping your customers sold on your product . . . and this is where Skellysolve forms an important part of your manufacturing picture.

You can bank on Skellysolve for the uniformity that helps to protect your product's high quality. Every batch has the same overall properties you need to keep your plant's production line flowing smoothly. Such dependability results from strict laboratory controls during every step of the Skellysolve manufacturing process. Skellysolve is not a "sideline" but a major product operation of a major oil company.

Run your own tests on Skellysolve and decide! Check its low end point, rapid evaporation, low vapor pressure, minimum of unsaturates and pyrogenic decomposition products. See what Skellysolve's minimum of low and high boiling compounds means in reduced rejects due to blushing and blisters. See how controlled vapor pressure guards against bloated containers. Note the minimum of low boiling compounds that eliminates "seeds" from rubber cements . . . and the minimum of high boiling compounds that gives high bonding strength free from greasy residues.

Special help wanted? Solvent application problems are the specialty of the Skellysolve Technical Fieldman. Send for him, he's always at your service. Or write for more complete technical facts.

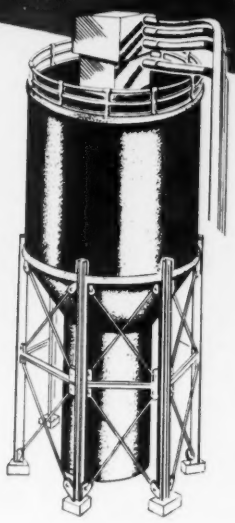
SKELLY

Skellysolve

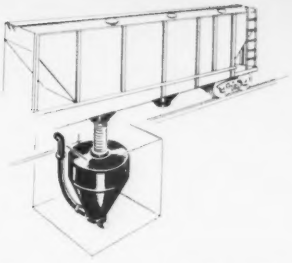
SOLVENTS DIVISION, SKELLY OIL COMPANY
KANSAS CITY, MISSOURI

Your Plans to modernize Your Banburys should include...

THE KENNEDY *Completely Automatic* PNEUMATIC CARBON BLACK SYSTEM

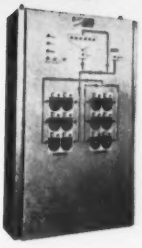


◄ Primary Storage Silo



Kennedy Automatic Pneumatic Transport Pump ►

Electronic Control Panel for automatic control of Carbon Black Handling System ►



HERE'S WHY!

★ Completely automatic operation of unloading bulk car, storing, selecting, distributing and weighing-out carbon blacks.

★ Serve any number of Banburys from one central storage unit with any number of blacks. All blacks can be transported through same pipe without contamination.

★ System is completely enclosed—revolutionizes plant housekeeping and improves efficiency by providing far cleaner working conditions.

★ Transport lines of standard pipe eliminate the need for space-wasting trusses and other unsightly structures.

★ Basic equipment has no high speed moving parts to wear and require frequent adjustment or replacement—maintenance is reduced to a minimum.

★ System can be expanded for future requirements at minimum cost and least disturbance to existing plant.

★ Kennedy Carbon Black feeders provide the ultimate in accurate proportioning of blacks to meet today's laboratory demands.

★ The Kennedy System meets every Carbon Black requirement for automatic Banbury operation. Every installation backed by years of research and development, extensive production facilities and a large staff of qualified personnel.

LEARN TODAY

how the KENNEDY completely automatic Carbon Black system can be fitted into your plans.

Send for Bulletin 52-F describing the Kennedy "PNEUMATIC" Carbon Black Handling System.

KENNEDY-VAN SAUN
MANUFACTURING & ENGINEERING CORPORATION
TWO PARK AVENUE, NEW YORK
***FACTORY* DANVILLE, PA.**

Paper coaters: Improved coated paper specialties mean a bigger market for you—and better coated papers begin with new Opalon 410 plastisol resin. You'll find it profitable to investigate the *product* and *production* advantages Monsanto's Opalon 410 delivers in the manufacture of coated papers for luggage, shoe findings, simulated leather notebooks and other applications.

For a better product—Opalon 410 provides the strength, durability and resistance to wear your product requires. It furnishes extra resistance to greases, oils, water, detergents, and discoloration caused by sunlight. Opalon 410, when used with other quality plastisol ingredients, offers a high degree of crack-free flexibility at low temperatures. It gives good adhesion, and makes possible a wide color range of imitation leather and other embossed and decorated effects.

For fast production—Opalon 410 means easy compounding; a simple stir-in process that requires no expensive equipment. It needs no milling or grinding during compounding . . . streamlines processing operations. A fast-dispersion type of resin, it increases your speed of plastisol preparation and assures the uniformity of dispersion necessary for quality coatings.

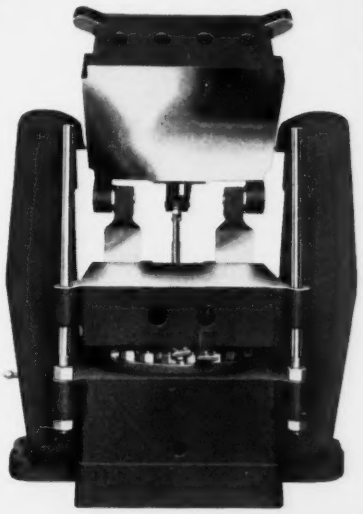
Why not look into Opalon 410 *stir-in* vinyl plastisol resin for your paper coating needs today? For complete information, write: MONSANTO CHEMICAL COMPANY, Plastics Division, Room 6902, Springfield 2, Mass.

MONSANTO
CHEMICALS AND PLASTICS
®

SERVING INDUSTRY...WHICH SERVES MANKIND

TILTING HEAD PRESS

eliminates mold handling



- Molds fasten to platen.
- Jaws open—operator removes work.
- Molds are filled and press closes.
- No heavy lifting or straining.
- No chance for off-center or slippage.
- Equal, uniform pressure.
- Operates off standard hydraulic drive or individual pumps.
- Can be equipped for Transfer Molding.
- All standard platen sizes with tonnage capacities up to 1,000 tons.

NE

National Erie products for the Plastic and Rubber Industries • Extruders • Simplex Doors for Autoclaves • Mills and Hydraulic Presses.

This old and well-known line of machinery was acquired March 1, 1952, by The Aetna-Standard Engineering Company. They are manufactured in their Warren, Ohio, and Ellwood City, Pa., plants. The sales and engineering of the National Erie line is the responsibility of Hale and Kullgren, Inc., Akron, O.

SALES and ENGINEERING by

HALE AND KULLGREN INCORPORATED

P. O. BOX 5231 • AKRON, OHIO

MANUFACTURING by

Aetna-Standard

THE AETNA-STANDARD ENGINEERING CO.
PITTSBURGH, PA.

Plants in Warren, Ohio
Ellwood City, Penna.

WHY ONLY THE MANUFACTURER CAN MAKE "GOOD AS NEW" BANBURY* REPAIRS

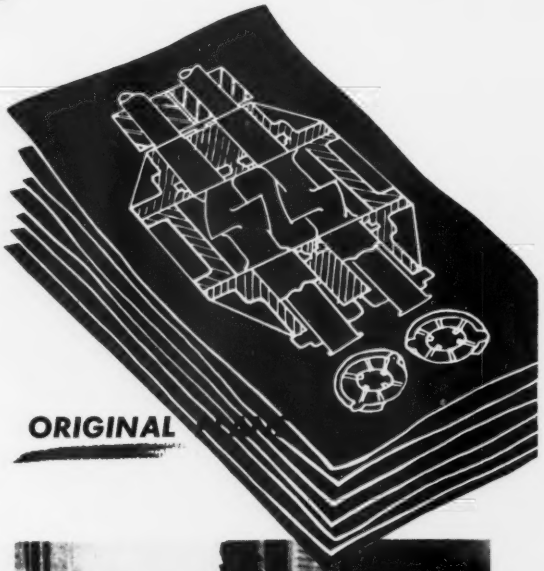
Every Banbury* mixer that leaves our shop after rebuilding carries a new machine guarantee. This guarantee provides assurance that the rebuilt machine will be "as good as new" when it is returned to service. How can we do this?

As the sole manufacturer of the Banbury mixer for thirty-six years, Farrel-Birmingham has unequalled experience, facilities and know-how to return a worn machine to its original work capacity. Furthermore, a Banbury rebuilt by us benefits from a product-improvement research program that has been continually carried on during the entire period that we have manufactured over 2,000 of these machines. Modern features of design and improved materials can now be incorporated into a machine being rebuilt, the same as in a new one.

Farrel-Birmingham is the only company having complete drawings showing the original dimensions of every part of the Banbury mixer. This is essential information for correct and precise work in rebuilding these machines. When a part is worn, blueprints show the Farrel-Birmingham engineer just how much rebuilding is required to return the part to its original size, contour and work efficiency. There is never any guesswork.

Farrel-Birmingham is the only company having complete jigs, fixtures and gauges necessary for satisfactory repairs. 242 of the pieces of a new Banbury have to be machined, calling for a total of 882 operations to finish. The use of our special equipment and facilities assures both accuracy and quick service in rebuilding work. Service is further facilitated by the largest existing stock of standard parts and complete new bodies.

A letter, phone call or wire to one of the offices listed below will bring an inspector to your plant, promptly and without cost. He will examine your machines thoroughly, report to you on their condition, and recommend what has to be done to make them "new again."



FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN. (Ansonia 4-3331)
AKRON, OHIO, 2710 First National Tower (POrtage 2-8871)
CHICAGO, ILLINOIS, 120 So. LaSalle St. (ANdover 3-6434)
LOS ANGELES, CALIF., 2032 Santa Fe Avenue (Lafayette 3017)
HOUSTON, TEXAS, 860A M&M Building (CApitol 6242)

Farrel-Birmingham®

FB-946

*Trade Mark

makers of... Quality Carbon Blacks

When talking about carbon blacks — no matter where — the thoughts invariably go to UNITED. The reason is simple enough: UNITED blacks have a long-established record for top notch quality, consistent uniformity and pleasing performance.

The widely known Dixiedensed (channel) and Dixie (furnace) brands made from gas or oil represent a complete range of reinforcement.

Naturally, leaders everywhere use UNITED blacks. Follow the leaders.

UNITED'S technical literature, a valuable reference for the entire rubber industry, will be sent free upon request to our Research Division.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK • AKRON • CHICAGO • BOSTON • MEMPHIS

Dixie 70. A remarkable carbon black which makes tires much stronger and keeps them running much longer and with less cracking. A natural for mileage tires.

Dixie 70. A super black, oil base and furnace made, that boasts of the particle fineness and surface nature that tires must have to withstand fast and heavy driving.

Dixie 70. The black that is in the front for performance in synthetic and crude rubber. Easy to mix, excellent for processing and tops for reinforcement.

Specify UNITED blacks for gratifying results.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS

Investigate All The Advantages of Plastoleins®

DOZ DIOZ

The Most Versatile LOW-TEMPERATURE *Plasticizers Available*

- ***Unmatched Low-Temperature Flexibility***
- ***Unusually Low Volatility***
- ***Low Water Extraction***
- ***Excellent Heat & Light Stability***
- ***High Plasticizing Efficiency***
- ***Extremely Low Soapy-Water Extraction***

Plastoleins 9058 DOZ (di-2-ethylhexyl azelate) and 9057 DIOZ (di-iso-octyl azelate) possess all the properties of a basic plasticizer and...in addition, offer all the advantages of low-temperature flexibility.

This balanced combination of important properties has led to its extensive use in all types of vinyl compounds including calendered and cast films, calendered sheeting, calendered and dispersion coated fabrics, and all types of extruded products.

Why not give your product better performance and extra sales-appeal by using DOZ or DIOZ. Write to Dept. U8 today for descriptive literature and samples of Plastolein 9058 DOZ (di-2-ethylhexyl azelate) or Plastolein 9057 DIOZ (di-iso-octyl azelate).

DOZ DOZ DIOZ DOZ DIOZ DOZ DIOZ DOZ DIOZ DOZ DIOZ DOZ DIOZ

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio

New York • Philadelphia • Lowell, Mass. • Chicago
San Francisco • Cleveland

Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles

EXPORT: 5035 RCA Bldg., New York 20, New York

A *Better* Plasticizer *and* Dispersing Aid

POLYMEL DX

A medium soft, friable polystyrene resin type material, ranging from amber to brown with no coloring properties. Specific gravity of 1.01, melting point of 215° F. Its characteristic odor is not present in the vulcanizate and it is not known to be toxic.

POLYMEL DX is a highly efficient, low-cost resin that provides smooth, easy processing properties without sacrificing physicals. Its use permits very large proportions of fillers to be incorporated readily into rubber compounds without the milling problems that usually follow. The resin also removes tack from rubber stocks.

POLYMEL DX can be used with GR-S, natural rubber, Neoprene and nitrile compounds and helps to blend combinations of these rubbers. It will greatly reduce shrinkage of uncured stocks and thus is highly desirable for both molded and extruded goods. This reduction of nerve makes it very useful in calendered goods, also.

POLYMEL DX is very economical—not only is it a low cost product in itself, its use will enable compounders to reduce by *as much as 25% the use* of high-styrene resins, *without lowering the quality of the compound!*

Investigate this remarkable resin soon. Send for your sample today, or better yet, order enough for a trial run in your plant.

Prices
13¾¢ lb. in truck loads
14¼¢ lb. 5000 lbs. to truck loads
14¾¢ lb. 1 drum to 4900 lbs.
FOB Baltimore

THE POLYMEL CORP.

1800 Bayard St.
Baltimore 30, Md.
Plaza 2-1240

Bloom PROBLEMS?

Stauffer CHEMICALS SINCE 1885

CRYSTEX 85% Insoluble Sulphur

CAN SOLVE THEM AND:

1. improve product quality and appearance

Crystex, because of its high insolubility in rubber, cannot migrate and "bloom" like ordinary sulphur in your rubber compounds. This assures better surface appearance, particularly important in white side-walls and other light colored consumer goods in which "yellow spots" would be objectionable.

By preventing bloom, Crystex improves the tack of built-up stocks such as tire carcasses, belting, and valve patch frictions, thereby guaranteeing good adhesion after vulcanization.

2. save on plant operation costs

A stock blended with Crystex can be kept for long periods before vulcanization without the danger of blooming. Mixing and vulcanization schedules can be made more flexible to permit maximum utilization of machinery and labor without the worry of a "time element" imposed by the danger of bloom.

3. increase compounding flexibility

Formulating with Crystex will allow variations to be made in factory recipes that tend to be "scorchy"; its use will control the degree of tackiness of factory stocks. The unusual characteristic of being insoluble in "anything and everything" except more sulphur may suggest additional uses in your formulations.

Enthusiastic acceptance of Stauffer CRYSTEX by the rubber industry has necessitated the construction of a new plant, and CRYSTEX is now produced at both Chauncey, N. Y., and Monongahela, Pa. Packed in 50-pound multiwall paper bags, Stauffer CRYSTEX is available in all quantities up to car-load.

Write for experimental samples or further information on the properties and uses of CRYSTEX.

STAUFFER CHEMICAL COMPANY

380 MADISON AVENUE, NEW YORK 17, N. Y.

221 N. LaSalle St., Chicago 1, Ill. • 636 California St., San Francisco 8, California
326 S. Main Street, Akron 8, Ohio • 824 Wilshire Boulevard, Los Angeles 14, Calif. • 8901 Hempstead Road, Houston 8, Texas • North Portland, Ore. • Weslaco, Texas • Apopka, Fla.

MR. CLIMCO SAYS...

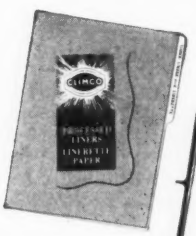
A CLIMCO LINER *outwears several plain liners!*

Climco Liners last longer because of their non-sticking quality, increased tensile strength and lasting flexibility.

In addition to reducing fabric purchases, Climco Liners also cut production costs — because they separate perfectly from the stock, down-time due to stock adhesions is eliminated. Tackiness of the stock is preserved, gauges are more easily maintained and latitude in compounding is enlarged. There is no lint or ravelings with Climco Liners and they can be stored horizontally if desired.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U.S.A.
Cable Address: "BLUELINER"



ILLUSTRATED LINER BOOKLET
Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS
Serving the Rubber Industry for 32 Years

CLIMCO — CLEVELAND, OHIO U.S.A.

Specialized grades for all types of

RUBBER AND RUBBER GOODS

Piccoumaron Resins offer many advantages in the manufacture of a wide variety of rubber goods, due to the compatability, chemical resistance, solubility and other desirable properties provided by these resins.

Piccoumaron Resins vary from liquids through viscous liquids, and tacky solids to high melting point, brittle solids, and in color from a deep reddish brown to a pale yellow shade. They are thermoplastic and do not become infusable on heating. Weight averages from 8.5 to 9.2 lbs. per gallon. In the higher melting-point grades they are quite resistant to oxidation.

Piccoumaron Resins have good acid resistance, being inert to all except strong concentrated oxidizing acids, and good alkali and salt resistance. These resins have an acid number of approximately zero, and do not react with most pigments.

How To Use Piccoumaron Resins

Softer grades (see table below) are used to give tack to rubber, especially for ply operations. The very soft grades are used as both softeners and plasticizers for rubber, allowing easy incorporation of pigments and fillers, and a smooth stock, milling readily.

For hard rubber goods, where increase in hardness and a leatherizing action are desired, Piccoumaron Resin XX-100 has been very successful. For tubular goods and various extrusion processes the 420 and 450 have proven very valuable, and for mechanical goods, toy materials, and the like, the 422, 425 and 457 are used.

In gaskets, jar rings, rubber belting and the like, the 420 and XX-100 grades are employed.

Picco 10 and 25 should be used where high plasticities are desired. Where high tensile strength is needed, use the 420-S and XX-100.

Large amounts of Piccoumaron Resins are used with rubber stocks in the manufacture of rubber soles, rubber heels and rubber footwear.

Rubber stocks compounded with Piccoumaron types of resin age well, and retain a desirable tack in storage before vulcanization.

Write for samples and complete details.

NUMBERING SCHEDULE PICCOUMARON RESINS

	COLOR	Light $1\frac{1}{2}$-$3\frac{1}{2}$	Medium 4-6	Reddish 6-9	Dark 9-12	Extra Dark 12-16	Extra Dark 12-16
MELTING POINT	Liquid Resin	459	429	449	469	439	
	10°C— 15°C	458	428	448	468	438	XX-10
	30°C— 35°C	457	427	447	467	437	XX-25
	40°C— 45°C	456	426	446	466	436	XX-40
	50°C— 55°C	455	425	445	465	435	XX-55
	65°C— 70°C	453	423	443	463	433	XX-70
	80°C— 90°C	452	422	442	462	432	
	95°C—105°C	450	420	440	460	430	XX-100
	110°C—120°C	450H	420H	440H	460H	430H	XX-115
	120°C plus	450EH	420EH	440EH	460EH	430EH	

SPECIAL GRADES—Special grades of Piccoumaron Resins can be made when required.
The colors shown are on the Coal Tar Resin Color Scale. The melting points are by the ball and ring method.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION
CLAIRTON, PENNSYLVANIA
Plants at: **Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.**
District Sales Offices: **New York, Chicago, Philadelphia, Pittsburgh**
Distributed by **HARWICK STANDARD CHEMICAL CO., AKRON 5, OHIO**

PICCO

Pennsylvania Industrial Chemical Corp. (RA)
Clairton, Pennsylvania

Please send bulletin and samples of Piccoumaron

for (application) _____

Name _____ Position _____

Company _____

Address _____

The Best Method Yet Devised . . .

FOR DICING SHEET STOCK

The Famous CUMBERLAND "Stair-Step" Dicer

Here at last is the answer to your problems of dicing rubber or vinyl sheet stock. Produces perfect cubes ranging in size from ⅛ to ½" by merely changing knives.

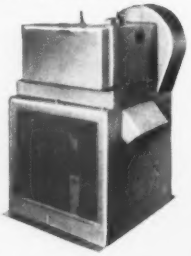
Comes in two sizes designed to handle sheets up to 7" or 14" in width. Other sizes made to order.

Input speeds range from 10 to 125 feet per min. depending on material and size of cube desired.

The CUMBERLAND Rotary Chopping and Dicing Machine

As a chopper, this machine efficiently cuts rubber and vinyl slabs into small pieces. Two sizes available to handle stock widths up to 14 or 24 inches.

As a dicer in modified form, handles principally vinyl sheet stock. A less expensive machine though less universal than the "Stair-Step" Dicer shown above.



For Granulating Plastic . . .
Investigate Cumberland's complete line of granulating machines. Request Bulletin 251

Write for Complete Information

CUMBERLAND Engineering Co. Inc.
DEPT. 3 · BOX 216 · PROVIDENCE · RHODE ISLAND
Builders of Better Machines for the Rubber and Plastics Industry

THE CARTER BELL MFG. CO. SINCE CARTER BELL PRODUCTS 1903 SPRINGFIELD, NEW JERSEY

Vulcanized
VEGETABLE OILS

rubber substitutes

Types, grades and blends
for every purpose, wherever
Vulcanized Vegetable Oils
can be used in production
of Rubber Goods—
be they Synthetic, Natural,
or Reclaimed.

A long established and proven product

THE CARTER BELL MFG. CO.
SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angeles

HYDROCARBON

PANAREZ

RESINS

3-210 AND 6-210 OUTSTANDING RUBBER COMPOUNDING RESINS

PROPERTIES
- Low Specific Gravity
- Low Odor
- Uniform Quality
- Improves Processing
- No Effect on Cure
- Light Color

FOR
- Better Flex Life
- Improved Abrasion Resistance
- Maximum Extrusion Rate
- Improved Ozone Resistance
- Excellent Electrical Characteristics

EXCELLENT COMPATIBILITY with
- Natural Rubbers
- General Purpose GRS
- Cold Rubber GRS
- Buna N Type Rubbers
- Butyl Rubber

PANAREZ	Specific Gravity	Color Barrett	Softening Point, °F
3-210	1.049	1	200-220
6-210	1.106	2	200-220

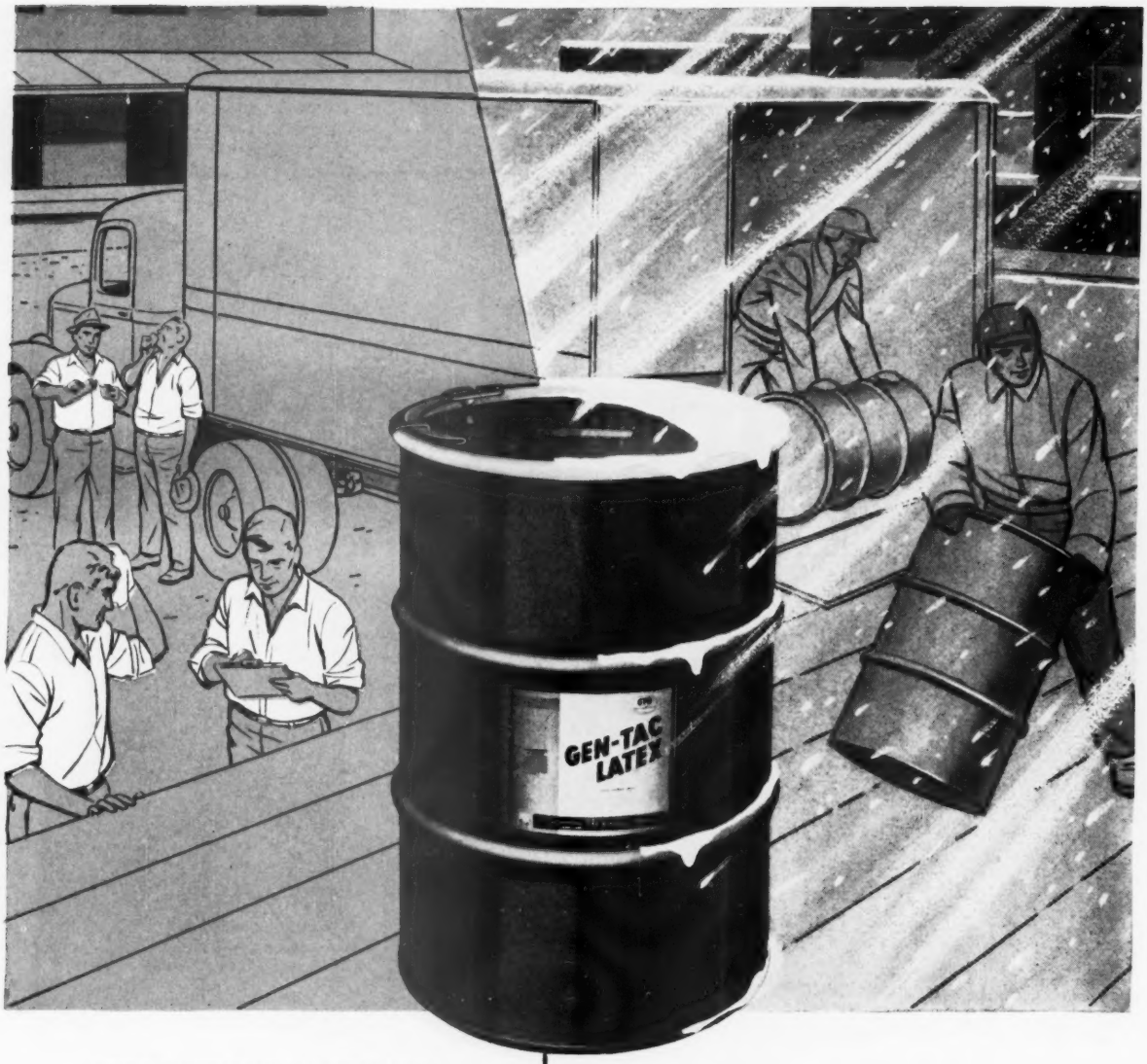
Flaked or Solid — Prompt Delivery — Unlimited Quantity

BEST — AND LOWEST COST, TOO!

PAN AMERICAN CHEMICALS

PAN AMERICAN *Chemicals*
DIVISION
Pan American Refining Corp.
122 EAST 42ND STREET · NEW YORK 17, N Y

Announcing—



KURE-BLEND® MT MASTERBATCH.
50% TETRAMETHYL THIURAM DISULFIDE AND 50% GR-S TYPE RUBBER

- Fast, easy mixing
- Excellent dispersion
- Dust-free
- Accurate weighing

KO-BLEND® I. S. INSOLUBLE SULFUR.
50% CRYSTEX AND 50% GR-S TYPE RUBBER

- Controls sulfur bloom
- Eliminates discoloration of light stocks
- Insures good dispersion
- Cuts milling time

Freeze-Stabilized GEN-TAC* Latex

We are proud to announce another first of real significance to the rubber industry . . . Freeze Stabilized Gen-Tac Latex. Through this important development, it is now possible to make shipment of Gen-Tac in temperatures down to 0°F. If the Gen-Tac is frozen by exposure to such temperatures, it will recover to its normal state upon thawing.

Our Research Laboratories have had drums of Freeze Stabilized Gen-Tac stored in the open continuously since September, 1952. The Latex is in perfect condition, and the bonding strength is as high today as that of freshly made Gen-Tac which has not been stabilized.

No change has been made in Gen-Tac other than the incorporation of the unique stabilization system, so Freeze Stabilized Gen-Tac may be used as a replacement for, or interchangeably with standard Gen-Tac. It has been thoroughly tested by our Tire Development Department and is now being used as standard production material.

Now in addition, General's Gen-Tac offers the additional exclusive advantage of freeze-stabilization at no added cost. For further information on Freeze Stabilized Gen-Tac or other General Tire Chemical Products, just fill out the coupon below.

*T. M. G T & R Co.

Creating Progress Through Chemistry

Chemical Division
GENERAL
THE GENERAL TIRE & RUBBER CO.

GEN-TAC

The General Tire & Rubber Company, Chemical Div.,
1708 Englewood Ave., Akron 9, Ohio

Send literature on ☐ Gen-Tac
☐ Ko-Blend ☐ Kure-Blend

Send sample of
☐ Gen-Tac ☐ Ko-Blend ☐ Kure-Blend
☐ Have your representative call

NAME_____

COMPANY_____

STREET_____

CITY_____

STATE_____

RA-8-54

FOR LONG-LASTING WHITENESS . . . BRIGHTNESS

UNITANE® 0-220 titanium dioxide

An Anatase Type Titanium Dioxide, UNITANE 0-220 is the economical pigment that assures maximum whiteness with minimum loading. It is especially recommended for producing brilliance in white and white-tinted articles.

Ask your American Cyanamid Pigments representative for full information about Cyanamid's complete line of UNITANES. There's a type and grade to meet your every need.

AMERICAN *Cyanamid* COMPANY

PIGMENTS DIVISION

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

BRANCH OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

the only rubber plant that can't use

NEVILLE CHEMICALS

For all the others Neville has a complete line of Coumarone-Indene Resins, as well as Petroleum Resins, Reclaiming Oils, Softeners, and Plasticizers.

Speaking of plants, our main one is located in the Industrial East with another in fast-growing Southern California. We are branching out too with warehouses in South Kearny, N.J., Philadelphia, Los Angeles, Montreal, Toronto, and Boston. So, whether you are on the main stem or not, Neville Products are near you.

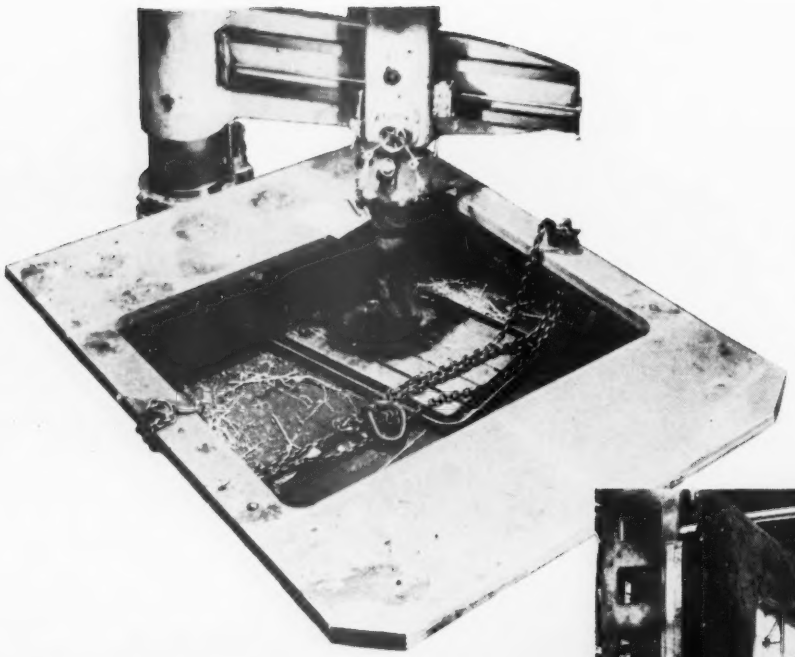
R-53

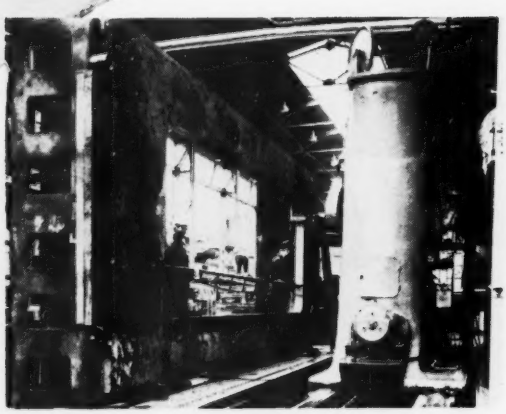
NEVILLE

NEVILLE CHEMICAL CO.

PITTSBURGH 25, PA.

Plants at Neville Island, Pa. and Anaheim, Cal.





Siempelkamp

HYDRAULIC PRESSES

Drilling and cutting operations in making the one-piece steel frame for a conveyor belt press.

SIEMPELKAMP is equipped to make any size or type of hydraulic press. Quotations submitted on any size hydraulic press, delivered cost, F.O.B. nearest port of entry. Compare our prices with any others. Direct credit arrangement to well-rated companies.

Exclusive Representative in U.S.A. to Rubber & Plastic Industries

William Tapper

30 South Broadway, Yonkers, N. Y.

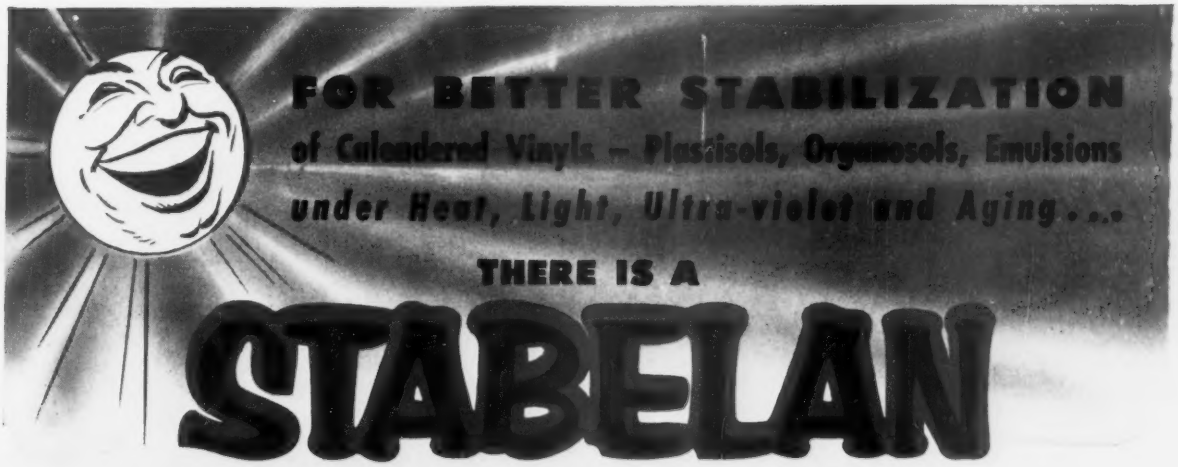
Phone: Yonkers 3-7455 Cable: Wiltapper

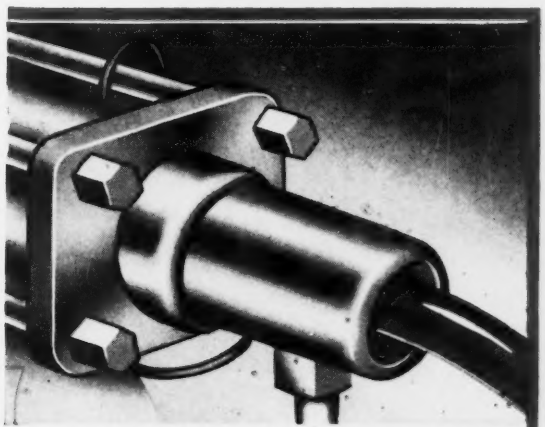
All Other Inquiries — Send direct to:

G. SIEMPELKAMP & CO., KREFELD, WEST GERMANY

(established 1883)

Telex 0853 811 Cable: Siempelkampco


FOR BETTER STABILIZATION
of Calendered Vinyls — Plastisols, Organosols, Emulsions
under Heat, Light, Ultra-violet and Aging . . .
THERE IS A
STABELAN



For Excellent Heat and Good Light Stability

STABELAN HR

PASTE - -

A "single package" stabilizer for high heat resistance plus good light stability . . . Contains cadmium and barium components and synergized chelating agent. Disperses easily in dry pre-blends, solutions and dispersions.

LIQUID - -

A synergized chelating agent.

POWDER - -

A metal bearing component of STABELAN HR paste.

STABELAN HR has been used with marked success in stabilizing all types of Vinyls containing organic and inorganic pigments.

For Excellent Light and Good Heat Stability

STABELAN E

STABELAN E — Paste — Provides excellent stabilizing for ultra-violet and outdoor aging . . . It gives good light fastness and heat stability. Heat stability and transparency may be improved when Stabelan E is used with Stabelan HR Liquid. Gives films that do not "blush" or absorb water . . . It is compatible with all tested pigments — even organic reds hold their hue and age well . . . It does not cause plating on rolls.

Write for complete data on these materials.

HARWICK STANDARD CHEMICAL CO.
AKRON, BOSTON, TRENTON, CHICAGO, LOS ANGELES

TRIM FLASHING in a Flash

and Clean as a Whistle!

Western's RMH Machine

cuts the cost of trimming as much as 75%

a factory in a foot of space!

FEATURES: Cuts on replaceable hardened steel plate. Foot control speeds operation. Simple, positive pressure adjustment. ½ H.P. motor Cutting area approx. 8½" x 9".

CUTS, PUNCHES and TRIMS in one swift operation!

DIES ARE OUR SPECIALTY

2 and 3 level dies are made for RMH. Change dies in just a few seconds with positive alignment.

FLASHING TRIM DIES
CLICKER DIES
WALKER DIES
I. D. and O. D. DIES
MALLET DIES
MACHINE DIES

POSITIVE SAFETY FEATURES

Machine *cannot* trip accidentally. Operator can view entire operation.

GET THE FULL STORY on Western Machines and Dies by sending for our free illustrated catalog today.

SEND SAMPLES of parts to be cut and flash trimmed for our recommendations.

For Versatility— "GO WESTERN"

Western SUPPLIES CO.

2920 CASS AVE., ST. LOUIS 6, MO.

Here's your NEW GUIDE *to Better Plasticizer Selection!*

	Low Temperature Flexibility		Low Soapy Water Extractibility		Processing Characteristics	
PX-104 DiButyl Phthalate	✓✓	✓✓			✓✓✓	
PX-108 DilsoOctyl Phthalate	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
*PX-114 Decyl Butyl Phthalate	✓✓	✓✓	✓	✓	✓✓✓	✓
*PX-118 IsoOctyl Decyl Phthalate	✓✓	✓✓	✓✓✓	✓✓✓	✓✓	✓✓
PX-138 DiOctyl Phthalate	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
PX-208 DilsoOctyl Adipate	✓✓✓				✓	✓✓
*PX-209 DiNonyl Adipate	✓✓✓		✓✓	✓	✓	✓✓✓
PX-238 DiOctyl Adipate	✓✓✓		✓		✓	✓✓
PX-404 DiButyl Sebacate	✓✓✓				✓✓✓	
PX-438 DiOctyl Sebacate	✓✓✓		✓✓✓	✓✓✓	✓	✓✓✓
*PX-800 Epoxy	✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓
PX-917 TriCresyl Phosphate		✓✓✓	✓	✓✓✓	✓✓✓	

*These products are Pittsburgh Coke & Chemical Company special plasticizers. Additional information on how they may improve your product is available. Write for Bulletins Pittsburgh PX-114, Pittsburgh PX-118, Pittsburgh PX-209 and Pittsburgh PX-800.

✓ Applicable
✓✓ Recommended
✓✓✓ Outstanding

PITTSBURGH *Job-Rated* Plasticizers are manufactured with your product requirements in mind. Whether it is an old standby such as DOP or one of our new specialty plasticizers, it is your assurance of more serviceable, more saleable products with less waste of materials and technical effort. Call or write today for more information on how Pittsburgh *Job-Rated* Plasticizers can help *you* produce better plastic products more efficiently.

W & D 51898

For Prompt Pittsburgh Sales Service
Call these numbers

PITTSBURGH ..... AT 1-2290
NEW YORK ..... LO 4-0550
CLEVELAND ..... CH 1-2170
LOS ANGELES ..... MU 4227

PITTSBURGH
COKE & CHEMICAL CO.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

These TINY, COLORFUL, PRECISION-CUT FIBERS...

Industry's Most Versatile Product

Cellusuede **FLOCK**

Flocked rubber glove, illustrated above, was produced in Cellusuede's well-equipped sample department as part of an ever-expanding program to assist flock users with special problems.

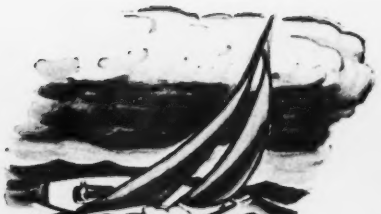
The unending variety of uses for Cellusuede Flock stirs the imagination of industry's most progressive minds. Cellusuede adds COLOR APPEAL in packaging, paper, and many other fields . . . gives an intriguing RICH TEXTURE to fabrics and toys . . . SILENCES unwanted noises when used as an acoustical material, everywhere from architecture to aircraft . . . DAMPENS VIBRATION in radio grills and phonograph turntables . . . INCREASES STRENGTH when used as a filler in plastics and rubber . . . thousands of uses, and every day designers, engineers, research and production men are finding more applications for Cellusuede Flock.

ENGINEERING SERVICE

Call on Cellusuede engineers and research men, without obligation, for data on how Cellusuede Flock may be applied to your job. WRITE FOR NEW BULLETIN illustrating profitable uses and application methods.

CELLUSUEDE PRODUCTS, INC.

PRODUCERS OF NATURAL AND SYNTHETIC FLOCK



Smoother Sailing

WITH *EEMCO* RUBBER and PLASTICS PROCESSING MACHINERY

MILLS
CRACKERS
WASHERS
REFINERS

★ ★ ★

PRESSES
compression
transfer
fibre glass reinforced
plastics

LABORATORY MILLS & PRESSES

EEMCO a leader in RUBBER and PLASTICS MACHINERY

If you are looking for answers to your rubber and plastics equipment problems, you will find them at EEMCO. Yes, they offer smoother sailing on many production problems with the machines which bear the EEMCO trademark. Skillfully designed by qualified engineers—and made by workmen with many years of experience—they offer the utmost in quality, design and workmanship. Serving manufacturers throughout the world, EEMCO rubber and plastics processing machines have proved their worth. EEMCO has its own Foundry, Machine Shop, and Engineering Department to insure fast delivery. Get prices and delivery dates from EEMCO where only the best has been built for many years.

EEMCO

ERIE ENGINE & MFG. CO.

Rubber & Plastics Machinery Division
12th St. & East Ave., Erie, Pa.

DOUBLE-CHECKED CHEMICALS
FOR THE RUBBER INDUSTRY

ETHYLAC

Gaining wide acceptance throughout the rubber industry . . .

This delayed action accelerator can be used to compound stocks with these characteristics:

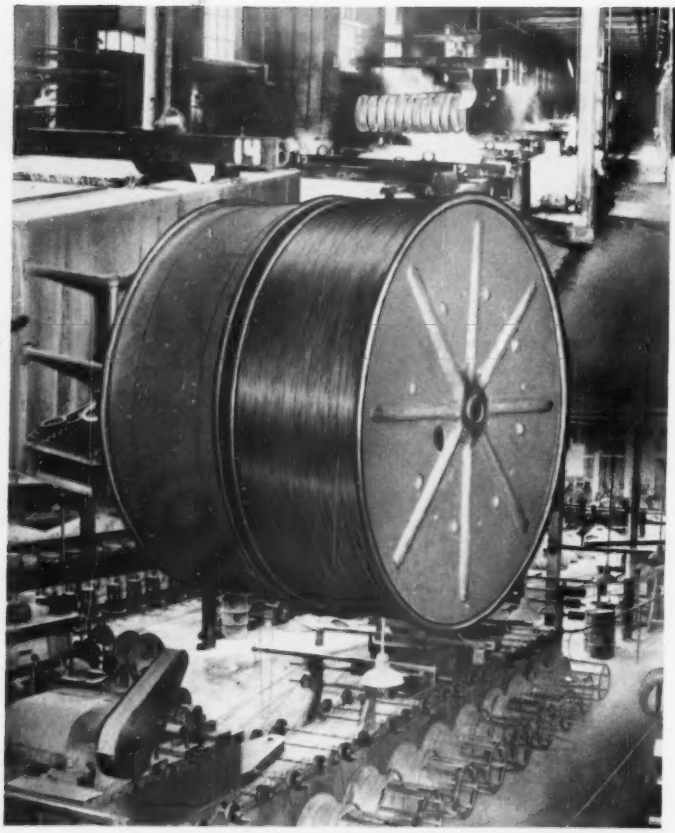
1. Safe Processing
2. Excellent Mold Flow
3. Low Compression Set
4. Low Heat Build-Up

SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.

A SUBSIDIARY OF THE PENNSYLVANIA SALT MANUFACTURING COMPANY

500 Fifth Ave., New York • 80 E. Jackson Boulevard, Chicago • 106 S. Main St., Akron
The Pennsylvania Salt Manufacturing Company of Washington:
Los Angeles • Tacoma • Berkeley • Portland
Shawinigan Chemicals, Ltd.: Montreal • Toronto
Airco Company International, New York



Hose REINFORCEMENT WIRE

It is no more logical to abolish capitalism because it hasn't abolished poverty than it would be to abolish the churches because they haven't abolished sin.

Here at Johnson we're human and we sometimes sin. But we have learned to profit by mistake and go on and on improving our product and our service.

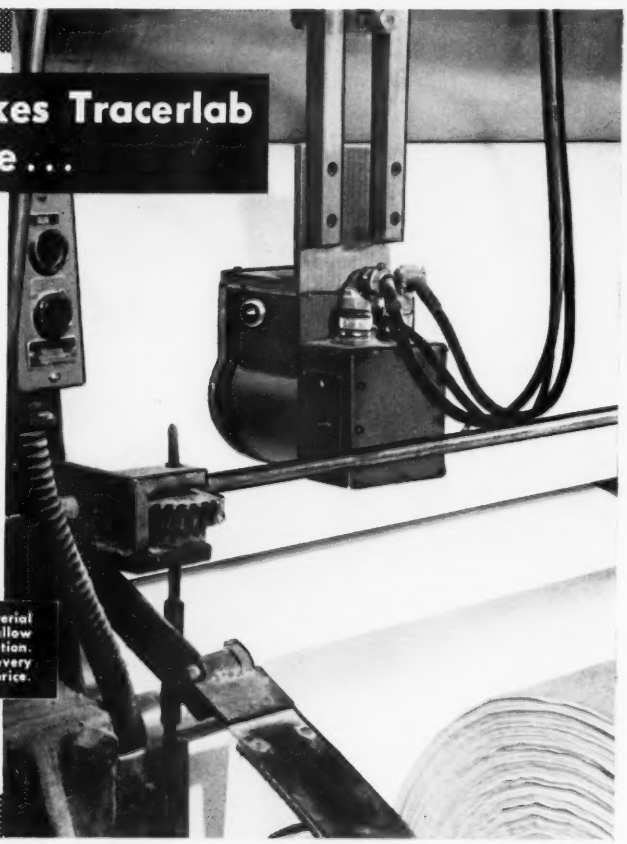
JOHNSON special bronze plated wire —standard for tire manufacturers and for vacuum and defroster hose producers. Advantages—uniformly clean finish . . . maximum adhesion to rubber . . . higher elongation . . . extra fatigue properties.

JOHNSON STEEL & WIRE CO., INC.
WORCESTER 1, MASS.
Akron, Ohio Los Angeles, Calif.
A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

SEAMLESS RUBBER Likes Tracerlab BETA GAUGES Because . . .

. . . SEAMLESS management says that through the use of the backscatter unit shown "we have been able to reduce variances in thickness of material application (adhesive compound) in our product by approximately 10%. We have found it possible to adjust our calender to correct gauge and maximum speed in approximately one third (1/3) the time formerly required. Any variations in thickness of material are immediately indicated. This allows us to make corrections to produce a consistent product to meet exacting specifications.

"We have also found the operators have accepted this gauge without hesitation. They have readily discarded old gauging methods and learned very quickly to accept the new gauge as a convenient and helpful asset in setting up their equipment for operation. In fact, so much so that they feel we would be unable to operate today without this equipment."



If YOU want to cut raw material costs and improve quality . . . allow us to arrange a FREE demonstration. We have a gauge model for every application . . . at the lowest price.

Tracerlab®
130 HIGH ST., BOSTON, MASS.

Cuts breakdown time 50%

Lowers power consumption

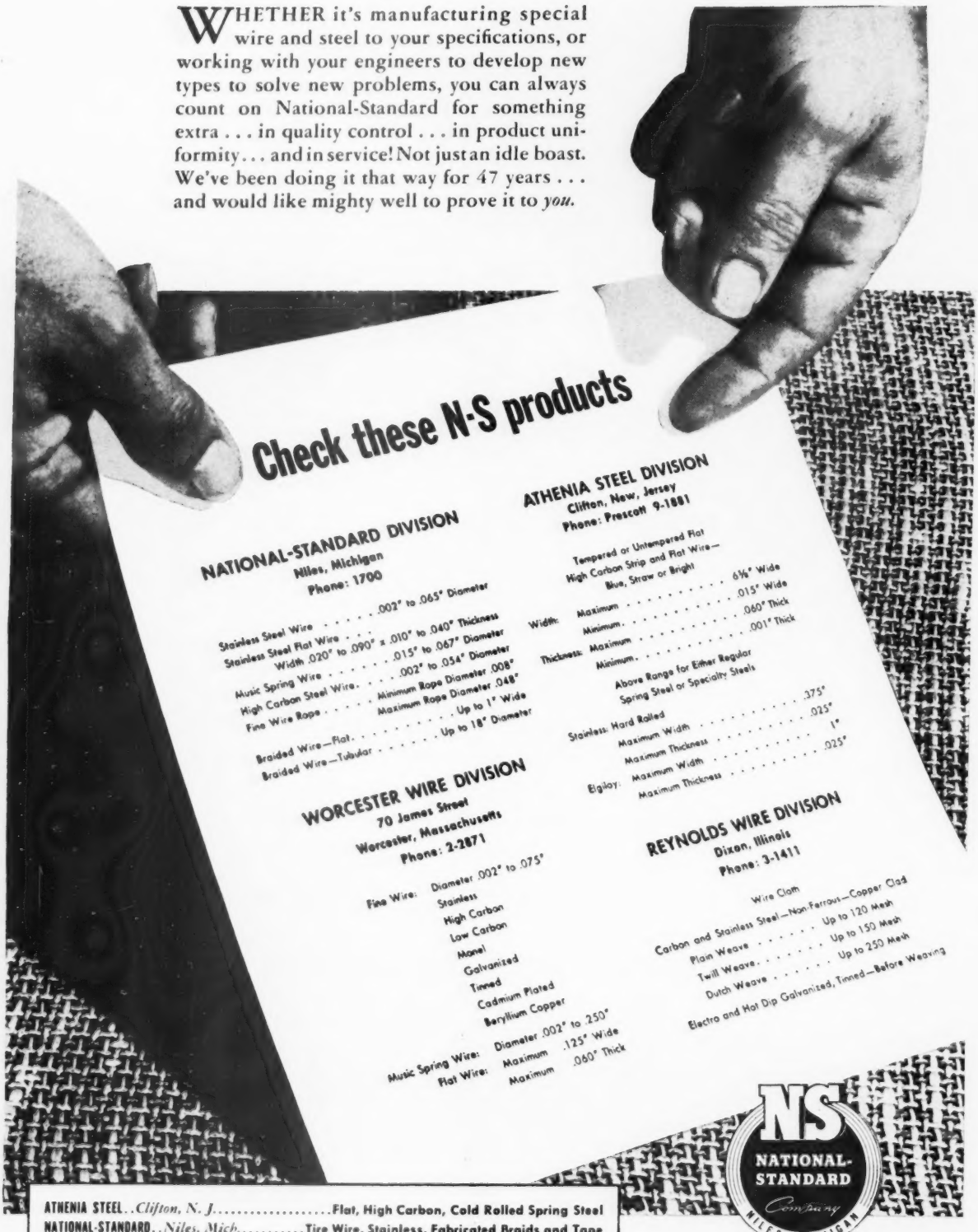
Gives better processing qualities

Ideal for producing excellent plasticity in natural rubber and GR-S.

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • H. M. Royal, Inc., Trenton, N. J. • H. M. Royal, Inc., Los Angeles, Calif. • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

Need special-purpose wire or steel?

WHETHER it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for 47 years . . . and would like mighty well to prove it to *you*.


Check these N-S products
NATIONAL-STANDARD DIVISION
Niles, Michigan
Phone: 1700
Stainless Steel Wire . . . . . .002" to .065" Diameter
Stainless Steel Flat Wire . . . Width .020" to .090" x .010" to .040" Thickness
Music Spring Wire . . . . . .015" to .067" Diameter
High Carbon Steel Wire. . . . .002" to .054" Diameter
Fine Wire Rope . . . . . Minimum Rope Diameter .008" Maximum Rope Diameter .048"
Braided Wire—Flat. . . . . Up to 1" Wide
Braided Wire—Tubular . . . . . Up to 18" Diameter
ATHENIA STEEL DIVISION
Clifton, New, Jersey
Phone: Prescott 9-1881
Tempered or Untempered Flat High Carbon Strip and Flat Wire—Blue, Straw or Bright
Width: Maximum . . . . . 6½" Wide
Minimum . . . . . .015" Wide
Thickness: Maximum . . . . . .060" Thick
Minimum . . . . . .001" Thick
Above Ranges for Either Regular Spring Steel or Specialty Steels
Stainless: Hard Rolled
Maximum Width . . . . . .375"
Maximum Thickness . . . . . .025"
Elgiloy: Maximum Width . . . . . 1"
Maximum Thickness . . . . . .025"
WORCESTER WIRE DIVISION
70 James Street
Worcester, Massachusetts
Phone: 2-2871
Fine Wire: Diameter .002" to .075"
Stainless
High Carbon
Low Carbon
Monel
Galvanized
Tinned
Cadmium Plated
Beryllium Copper
Music Spring Wire: Diameter .002" to .250"
Flat Wire: Maximum .125" Wide
Maximum .060" Thick
REYNOLDS WIRE DIVISION
Dixon, Illinois
Phone: 3-1411
Wire Cloth
Carbon and Stainless Steel—Non-Ferrous—Copper Clad
Plain Weave . . . . . Up to 120 Mesh
Twill Weave. . . . . Up to 150 Mesh
Dutch Weave . . . . . Up to 250 Mesh
Electro and Hot Dip Galvanized, Tinned—Before Weaving

ATHENIA STEEL..*Clifton, N. J.*.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..*Niles, Mich.*.....Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE..*Dixon, Illinois*.....Industrial Wire Cloth
WAGNER LITHO MACHINERY..*Jersey City, N. J.*.....Metal Decorating Equipment
WORCESTER WIRE WORKS..*Worcester, Mass.*.....Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.
NILES, MICHIGAN

FIRST all-decyl phthalate (introduced by Cabot in July, 1952) **STILL FIRST IN QUALITY**

Cabflex® DDP

CABOT's di-decyl phthalate

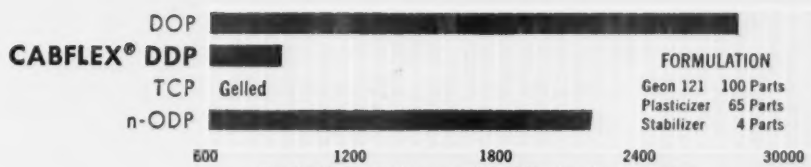
- Cabflex® Di-OP
  di-iso-octyl phthalate
  standard primary plasticizer
- Cabflex® DOP
  di-2-ethylhexyl phthalate
  standard primary plasticizer
- Cabflex® ODP
  iso-octyl decyl phthalate
  improved flexibility permanence in vinyl compounds
- Cabflex® DDP
  di-decyl phthalate
  new high molecular weight diester imparting remarkably low volatility
- Cabflex Di-OA®
  di-iso-octyl adipate
  standard low temperature plasticizer
- Cabflex® DOA
  di-2-ethylhexyl adipate
  standard low temperature plasticizer
- Cabflex® ODA
  iso-octyl decyl adipate
  improved low temperature permanence in vinyl compounds.
- Cabflex® DDA
  di-decyl adipate
  new low temperature diester with low volatility and high efficiency
- Cabflex® Di-OZ
  di-iso-octyl azelate
  low volatility, good water immersion properties impart excellent low temperature permanence
- Cabflex Di-BA®
  di-iso-butyl adipate
  non-toxic, approved for use in vinyl food wrappings by Food & Drug Administration
- Cabol 100
  hydrocarbon oil plasticizer
  low cost plasticizer, with plasticizer efficiency of 1.5; up to 50% compatibility with octyl-phthalate type plasticizers

Cabot makes the Cabflex® DDP but not the finished product

LOWEST IN WATER EXTRACTION

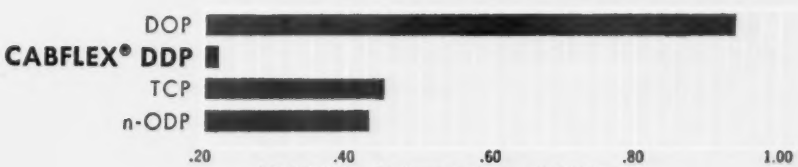
% Weight Loss in Water After 23 Days—Method of E. F. Schulz

LOWEST IN VISCOSITY INCREASE



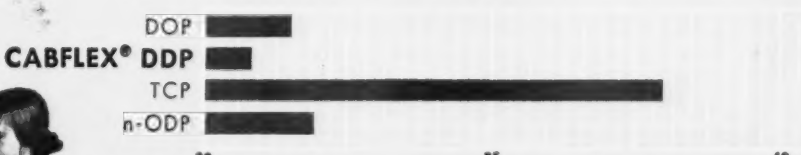
Plastisol Viscosity Increase After 4 Weeks—Centipoises

LOWEST IN VOLATILITY



SPI Volatility—24 Hours at 70° C—Weight Loss %

LOWEST IN COST



Pound Volume Cost in Cents Based on Current Listed Prices of Plastics Materials

Send for samples, technical information and prices

CABOT PLASTICS CHEMICALS DIVISION

GODFREY L. CABOT, INC. 77 Franklin St., Boston 10, Mass.

AIKEN
RUBBER
CLAY
● From the newest and most modern clay processing plant in the United States comes a new C. P. HALL CO. product—AIKEN CLAY.
AIKEN CLAY is rubber clay as YOU like it: Light in Color; "Hard"; Readily available; Uniform; Packed in compressed bags; and Palletized if you prefer. Samples and test data available on your request.
Produced by International Clay Corporation
AKRON OHIO • CHICAGO ILLINOIS • NEWARK NEW JERSEY
The C. P. Hall Co.
CHEMICAL MANUFACTURERS

It's NEW and it's WONDERFUL!

Marbon "8000-A"®

Reinforcing High Styrene Resin

Enjoy New, Improved, Economical Processing at Lower Temperatures and Shorter Banbury Mixing Cycles!

Marbon "8000-A" resin fluxes rapidly at lower temperatures (165-175 degrees F.) for improved dispersion, shorter mixing cycles, faster heat-plasticizing action with lowered power demand. A superior-processing resin with all the reinforcing properties of Marbon 8000. Especially suitable for OPEN-MILL mixing under marginal heat conditions.

WRITE *Today* FOR COMPLETE TECHNICAL LITERATURE

Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

It BLENDS as it STRENGTHENS as it IMPROVES

TITANOX®

makes kitchen helpers brighter

Rubber kitchen helpers such as drain mats, sink liners, stove-top mats and dishracks in white or cool pastels not only lighten kitchen chores but brighten kitchen hours.

The choice for clean whites and cheery tints in the compounds that make these helpers is TITANOX white titanium dioxide pigments. These ideal whiteners and brighteners are first choice, too, for any other compounds that must be whitened or brightened.

Our Technical Service Department will be glad to help you achieve the most desirable white pigmentation in your compounds through the best use of TITANOX. Titanium Pigment Corporation, 111 Broadway, NewYork 6, N.Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

®TITANOX

the brightest name in pigments

2421

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

Shell Dutrex®

Plasticizers and Extenders for Rubber and Plastics—quality and economy combined

SHELL OIL COMPANY

50 WEST 50th STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

Now Available—

Second Edition of

LATEX IN INDUSTRY

By ROYCE J. NOBLE, Ph. D., F. I. R. I.

The first edition of this valuable book was published in 1936 and has been out of print for many years. Accordingly, the publication of a completely revised and enlarged edition is welcome news to the thousands of users of rubber latex who have been seeking an up-to-the-minute text book.

The author has kept posted on every phase of the latex industry since the first edition and has incorporated in the new edition complete details on all current uses of this versatile material. The book is replete with illustrations, charts, formulas and full descriptions of the various processes in use today.

920 Pages • 6 x 9 Inch • 25 Chapters

Bibliography • Author Index • Subject Index

PRICE: $15.00 Postpaid in U. S.
$16.00 Postpaid In All Other Countries

Published by

RUBBER AGE

250 West 57th St. New York 19, N. Y.

For highest quality

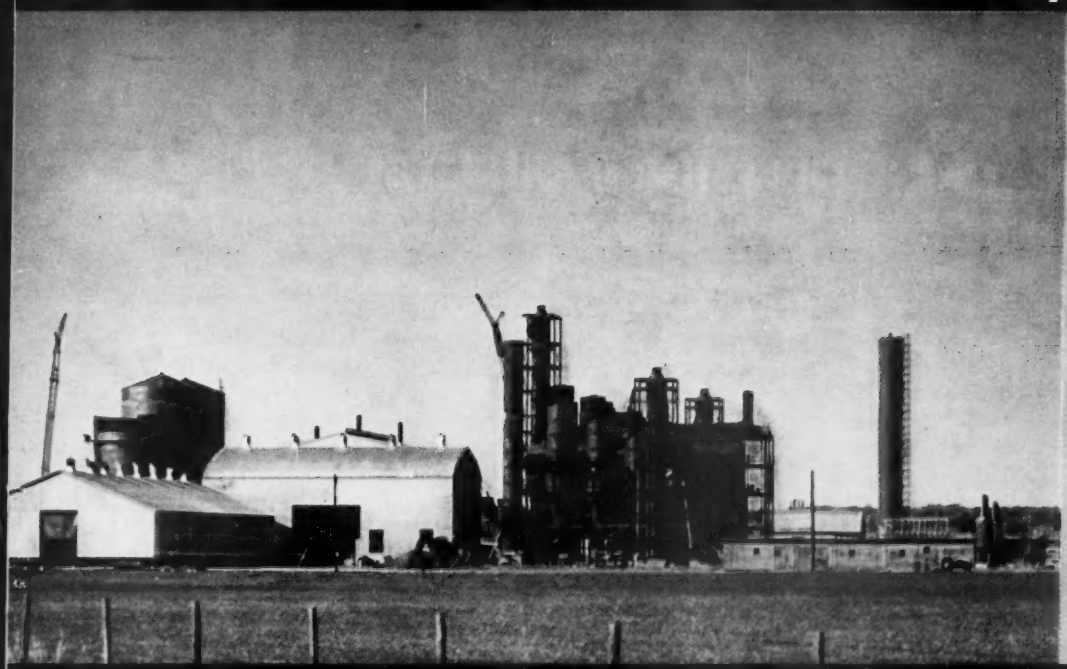
HAF-SAF BLACKS

Witco-Continental offers

NEW

the complete facilities of its

PONCA CITY, Oklahoma, plant –



— observing the strictest quality control to meet the high standards and growing demands of the rubber industry.

For complete line of Witco-Continental Carbon Blacks

Witco-Continental CARBON BLACKS

Recognized *for over twenty-five years* as dependable
Carbon Blacks for rubber products of superior quality.

Channel Blacks

Continental® AA—Easy Processing (EPC)—Witco No. 12
Continental A—Medium Processing (MPC)—Witco No. 1
Continental F—Hard Processing (HPC)—Witco No. 6
Continental R-40—Conducting (CC)

Furnace Blacks

Continex® SRF—Natural Gas Type, Semi-Reinforcing
Continex SRF-NS—Natural Gas Type, Non-Staining
Continex HMF—Natural Gas Type, High Modulus
Continex HAF—Oil Type, High Abrasion
Continex FEF—Oil Type, Fast Extruding
Continex SAF—Oil Type, Super Abrasion

Witco-Continental's technical service staff will be glad to assist you
with your rubber formulation problems.

WITCO CHEMICAL COMPANY

CONTINENTAL CARBON COMPANY

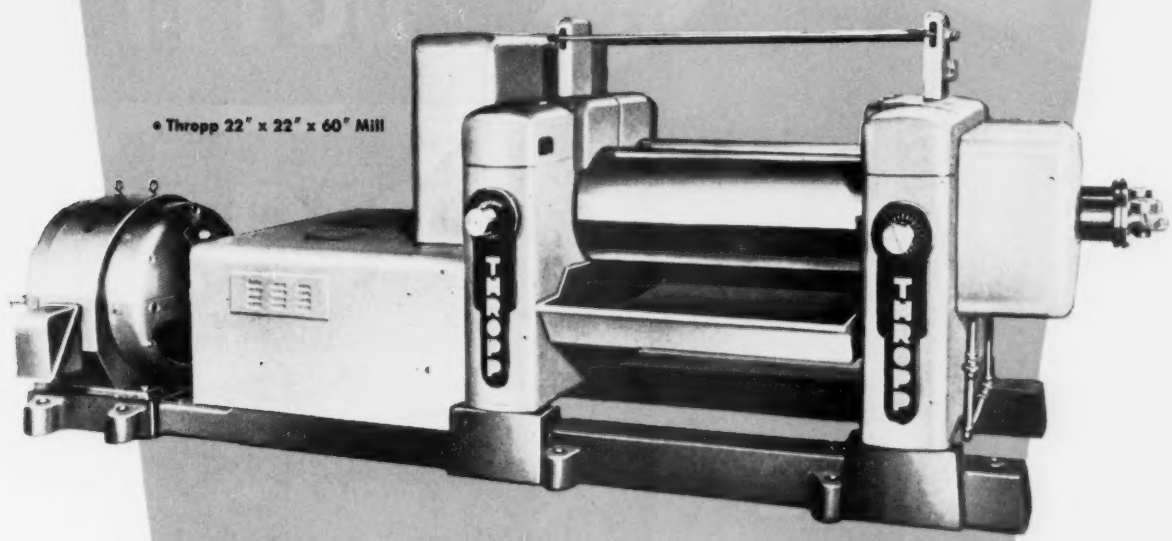
260 Madison Avenue, New York 16, N. Y.

Akron · Amarillo · Los Angeles · Boston · Chicago · Houston
Cleveland · San Francisco · Atlanta · London and Manchester, England

Here it is--

the mill YOU designed!

• Thropp 22" x 22" x 60" Mill



Built to stand continuous hard service in the Rubber and Plastics Industries

It was *your* experience, and that of many other rubber and plastics manufacturers that prescribed the specifications for this—our latest 60" mill:

The clean, streamlined design affords a new concept in milling—combining minimum maintenance and maximum efficiency with superior performance.

Send for further information.

Wm. R. THROPP & Sons

Division of
J. M. Lehmann Company, Inc.
Lyndhurst, N. J.
550 New York Ave.

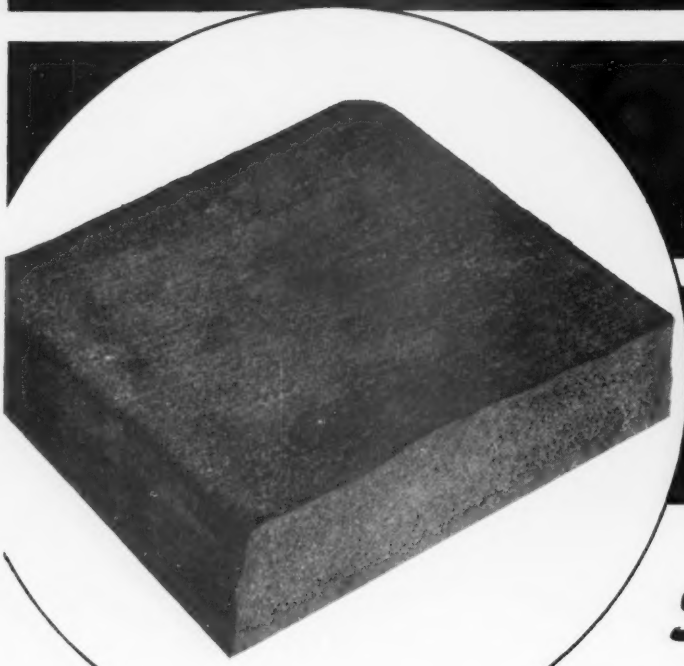
Have you tried

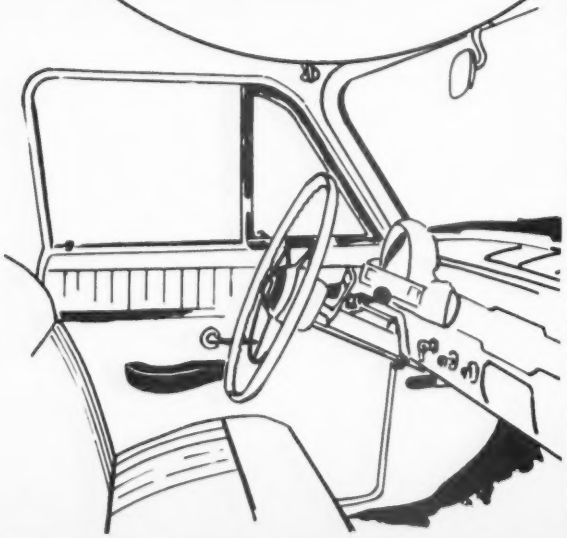
BUTYLITE #5950

BUTYL RECLAIM

for

Sponge Rubber?





A typical formula for Automotive Sponge Applications (Armrests, etc.) is as follows:

FORMULA A-380-6

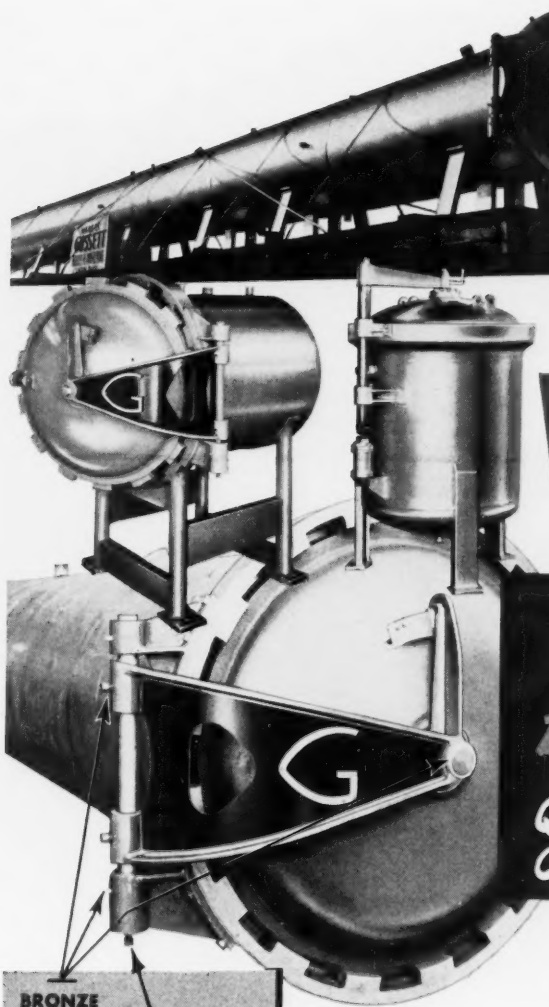
GRI 18	19.8
PEQUANOC BUTYLITE #5950 RECLAIM	34.6
Zinc Oxide	2.4
Stearic Acid	1.6
Sodium Bicarbonate	2.4
Talc	6.4
M. T. Black	6.4
Light Process Oil	23.6
Sulfur	1.6
T M T D S	.8
Zenite	.4
	100.00
Material Cost Per Lb.	11.83c

Cure 1″ Slab 20 Minutes @ 320° F.
.25 oz./cu. in.—.35 oz./cu. in.

Pequanoc Rubber Co.

MANUFACTURERS OF RECLAIMED RUBBER

MAIN SALES OFFICE and FACTORY: BUTLER, N. J.



GUSSETT

VULCANIZERS

WITH

GUSSETT EASY GLIDE QUICK OPENING DOORS

Cost Less to Own ...Less to Operate

Safe, Fast, Easy Door Operation

Note use of heavy lubricated bronze bushings at all wearing points and thrust bearing to support weight of door.

The Gussett Easy-Glide Quick-Opening Door is the result of almost forty years of practical experience in designing and building processing equipment for the rubber industry.

Fabricated of heavy steel plate, it offers high strength and a higher factor of safety without excessive weight. Precision machining insures accurate seating and freedom from leakage.

The large-diameter hinge pin and door center pin turn in heavy, pressure-lubricated bronze bushings and the weight of the door is supported by heavy-duty roller thrust bearings to minimize time and effort required to open and close the door and insure long, trouble-free service. Hundreds of Gussett Easy-Glide doors are in use all over the world.

Easy-Glide Doors are furnished without extra cost (often at important savings) on all Gussett-built Vulcanizers . . . horizontal or vertical . . . 18 inches and larger . . . any desired length . . . for any working pressure up to 600 pounds.

WRITE OR WIRE FOR BULLETIN

GUSSETT BOILER & WELDING, INC.

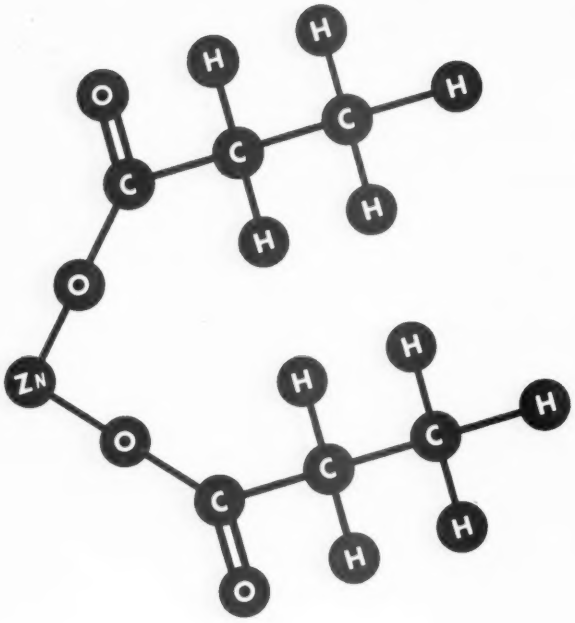
1545 Whipple Road S. W. • Canton 10, Ohio

ACTIVATOR NEWS

HORSE HEAD PRODUCTS

A supplement to THE ACTIVATOR—the house organ issued by The New Jersey Zinc Company for over 15 years to aid the Rubber Industry in its use of Zinc Oxide.

FAVORED FORMULA FOR FASTER PROCESSING of ZINC OXIDE



Introduced to the Rubber Industry just a few years ago, this chemical (zinc propionate) is already the most favored processing and dispersion aid for zinc oxide.

It is available to the Rubber Industry in the form of a coating on zinc oxide, favorably modifying its physical properties without interfering with its activating characteristics.

Zinc propionate is formed as a coating on zinc oxide when the latter is treated with propionic acid at an elevated temperature. This coating forms around the individual particles, modifying their characteristics in these 3 ways:

1. **Prevents formation of aggregates—aids dispersion and reinforcement.**
2. **Provides faster wetting by rubber—cuts mixing time.**
3. **Adds plasticizing effect—speeds processing.**

These advantages, available only in Protox* zinc oxide, are proved by many manufacturers, as Protox is today the most widely used brand of zinc oxide. As one Banbury operator puts it, Protox-166 "streaks in" or "smears into the rubber" while untreated zinc oxide "spots in."

*U.S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY

Producers of Horse Head Zinc Pigments

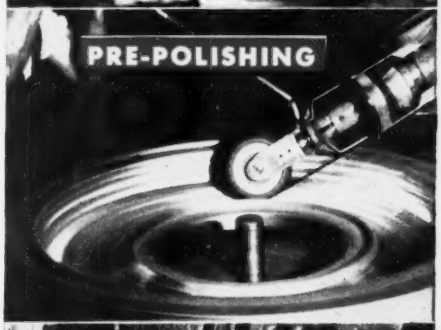
... most used by rubber manufacturers since 1852

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

Tire mold making is at its best—

at BRIDGWATER's ATHENS MACHINE DIVISION



In Size, Facilities and Skills, We're Equipped To Serve Your Tire Mold Requirements with

★ FASTER PRODUCTION of
★ HIGHER QUALITY MOLDS at
★ NO PREMIUM IN PRICE

Already the largest plant in the world devoted exclusively to tire mold manufacture, Bridgwater *continues* to expand the facilities and floor space of its Athens Machine Division . . . as often as required to make sure immediate and individual attention can be given to our customers.

At Athens, specialization in the one product enables us to produce highest quality tire molds in engraved steel, cast iron or aluminum — in any type or size — quickly, and at most favorable cost.

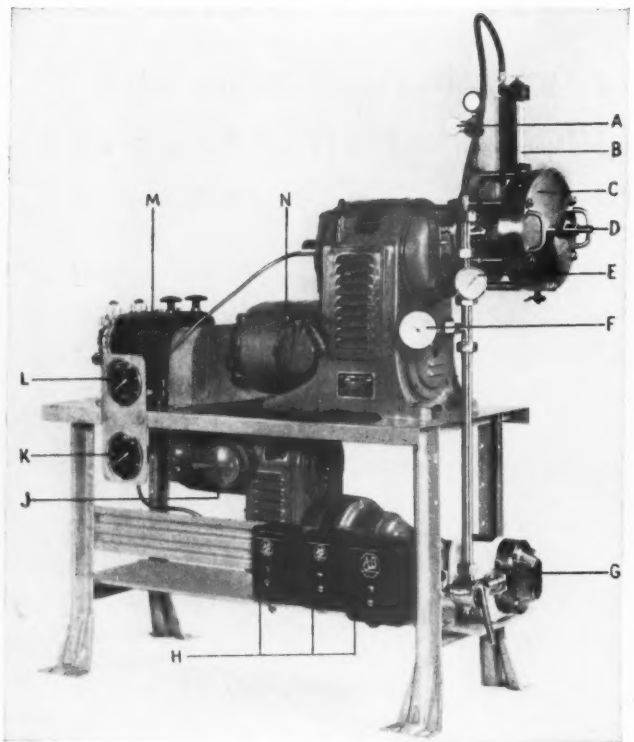
Athens Machine Division

BRIDGWATER MACHINE COMPANY

AKRON, OHIO

1922

Foam Rubber mixed in 3 seconds!



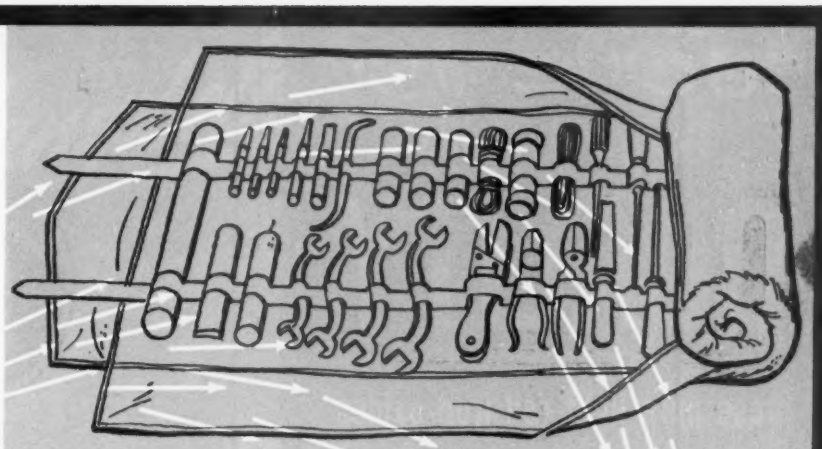
● Mixing by the batch method is slow and wasteful in comparison with the instant, continuous, automatic mixing of foam rubber now to be had in Oakes equipment. Material is in and out of the mixing head in two or three seconds. The resultant product is so superior in quality that this mixer is now standard equipment in large and small plants throughout the world. The advantages are many. The product is uniform, fine-celled, velvet-smooth. The mixer costs less to install and maintain. Control of density is absolute. Rejects are reduced by 75 percent. Losses due to waste gelled latex are practically eliminated. Less labor is required. Foam is more stable. Injection molding is made easy. The entire mixing operation is continuous and automatic, under instant push-button control at all times. Throughput capacity is anything desired from 50 to 1800 pounds of wet latex per hour. Mixers can be had in two sizes. The mixer shown is our smaller model 10-M.

A. Air Pressure Regulating Valve
B. Air Flowmeter
C. Mixing Head
D. Discharge Hose Connection
E. Product Thermometer
F. Pressure Gauge
G. Latex Pump
H. Starting Boxes
J. Pump Speed Regulator
K. Pump Tachometer
L. Mixer Speed Tachometer
M. Chemical Proportioning Pumps
N. Mixer Speed Regulator

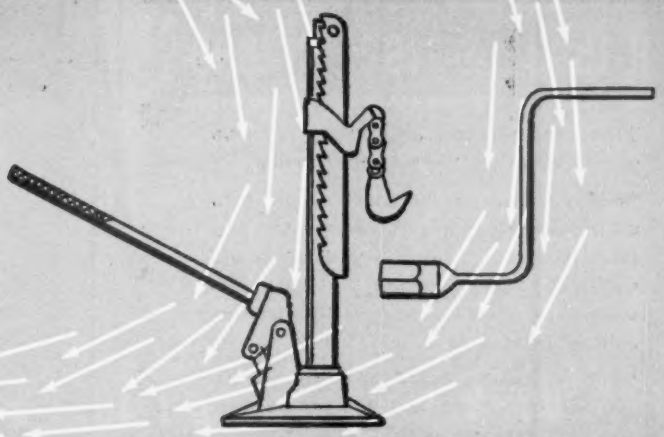
THE E. T. OAKES CORPORATION

COMMACK ROAD, ISLIP, L. I., NEW YORK

How long
did it take
to get
from here



to here?



Answer:
Twenty years.

The eighteen-pound kit containing 38 tools was considered just what the motorist needed in 1906. Gradually, as automobiles improved, the need for tools decreased until approximately twenty years later a simple jack was the main tool carried by motorists.

And as cars improved, the rubber industry grew along with them, until today it is one of the largest in the country. Monsanto has played an important part in this progress. Its complete line of accelerators, antioxidants and special materials for rubber are virtually standards of the industry.

For complete information about these products:

Get your copy of the new catalog, "Chemicals for the Rubber Industry." Entirely revised and up-to-date, this catalog is now available. Send for your copy now. Write to MONSANTO CHEMICAL COMPANY, Rubber Chemicals Department, 920 Brown Street, Akron 11, Ohio.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY
WHICH SERVES MANKIND

MONSANTO CHEMICALS FOR THE RUBBER INDUSTRY

ANTIOXIDANTS
Flectol* H
Santoflex* B
Santoflex BX
Santoflex 35
Santoflex AW
Santowhite* Crystals
Santowhite MK
Santowhite L
Santowhite Powder

ALDEHYDE AMINE ACCELERATORS
A-32
A-100

MERCAPTO ACCELERATORS
Santocure*
El-Sixty*
Mertax (purified Thiotax)
Thiotax (2-Mercapto benzothiazole)
Thiofide* (2,2′ dithio-bis benzothiazole)

GUANIDINE ACCELERATORS
Diphenylguanidine (D.P.G.)
Guantal*

ULTRA ACCELERATORS FOR LATEX, ETC.
R-2 Crystals
RZ-50
RZ-50-B

Pip-Pip
Thiurad* (Tetramethyl-thiuram disulfide)
Ethyl Thiurad (Tetramethyl-thiuram disulfide)
Mono Thiurad (Tetramethyl-thiuram monosulfide)
Methasan* (Zinc salt of dimethyl dithiocarbamic acid)
Ethasan* (Zinc salt of diethyl dithiocarbamic acid)
Butasan* (Zinc salt of dibutyl dithiocarbamic acid)

SPECIAL MATERIALS
Thiocarbanilide ("A-1")
Santovar*-A
Sulfasan R
Insoluble Sulfur "60"

COLORS

DEODORANTS

*Reg. U. S. Pat. Off.

everybody talks

QUALITY

these pure light red iron oxides

by WILLIAMS assure it!

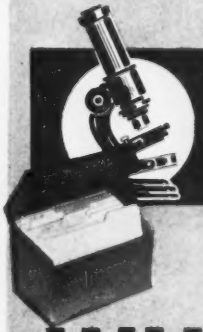
R-1599 R-2199 R-2899

They represent the ultimate in red iron oxide colors for the rubber industry.

Williams iron oxides come to you with all the benefits of our 75 years in the pigment business . . . and as a result of our experience in producing pure red iron oxides to specifications of the leading rubber companies.

Each is manufactured to rigid specifications for copper and manganese content, pH value, soluble salts, fineness, color, tint and strength by controlled processes and with special equipment. *The result is absolute uniformity of product.*

If you haven't already done so, try these finest of all iron oxide colors. Your own tests will show there is no equal for Williams experience.



LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM

Whatever your color problem, bring it to Williams. Our 75-year experience can often save you time, money, and headaches in proper color formulation.

Address Dept. S,
C. K. Williams & Co., Easton, Pa.

IRON OXIDES • CHROMIUM OXIDES
EXTENDER PIGMENTS

WILLIAMS

COLORS & PIGMENTS

C. K. WILLIAMS & CO.

EASTON, PA. • EAST ST. LOUIS, ILL. • EMERYVILLE, CALIF.

T-C

TANNEY-COSTELLO INC.

CABLE ADDRESS "COSTAN" AKRON

P.O. BOX 1113
860 S. TALLMADGE AVE.
AKRON 9, OHIO

Scrap Rubber

•

Natural Rubber

•

Plastic Scrap

Representatives for:

S. J. PIKE & CO., INC.
Crude Rubber Importers
30 Church Street
New York 7, New York

Campbell SOAPSTONE DISPENSER

MEMO

Jim— Better find out about FEMCO'S Campbell Soapstoner understand it's now equipped to dust 3/32" I.D. Tubing
Bill—

● Bill's right! The big news in the industry is about FEMCO'S Campbell Soapstoner. It's now equipped with a special mixing chamber that enables you to dust tubing as small as 3/32" in diameter. Better get the facts now about Campbell Soapstoners — leaders in the dusting field for years — now used by most rubber companies.

Write, wire or call for quotation on the Campbell Soapstoner, the Campbell Heavy Duty Roller Die Cutter or other Campbell-designed, FEMCO-Built special machinery.

The FALLS ENGINEERING AND MACHINE CO.

Established 1917

1734 FRONT ST., CUYAHOGA FALLS, O.

For Rubber Compounding Use VELSICOL RESINS

NOW AVAILABLE IN VARYING MELTING-POINT RANGES AND COLORED GRADES

SOME SUGGESTED APPLICATIONS:

- Mechanical Goods
- Electrical Insulation Compounds
- Rubber Shoe Soles and Heels
- Rubber Floor Tiling
- Gaskets and Jar Rings
- Rubber Adhesives and Cements
- Molded Rubber Products
- Tubular Compounds
- Reclaimed Rubber Sheeting
- Colored Rubber Stocks
- Battery Cases
- Hard Rubber Compounds

FEATURES:

1. THERMOPLASTIC HYDROCARBON RESINS.
2. COMPATIBLE WITH NATURAL AND SYNTHETIC RUBBERS.
3. EFFECTIVE PLASTICIZERS AND SOFTENERS . . . in highly-loaded clay stocks or in recipes incorporating carbon black.
4. MILL READILY.
5. EXCELLENT DISPERSING AGENTS FOR FILLERS AND PIGMENTS.
6. FACILITATE PROCESSING PROCEDURES . . . impart excellent milling, calendering processing and tubing characteristics to stocks.
7. IMPART EXCELLENT PERFORMANCE CHARACTERISTICS . . . such as good tensile strength, elongation and modulus, as well as good resistance to abrasion and aging.
8. POSSESS HIGH ELECTRICAL RESISTANCE PROPERTIES.
9. AID IN THE DEVELOPMENT OF NON-SCORCHY STOCKS . . . without excessive retardation of cure at high temperatures.

For additional information concerning properties and applications of Velsicol Resins, WRITE:

VELSICOL CORPORATION

General Offices and Laboratories
330 East Grand Avenue, Chicago 11, Illinois

Export Division
100 East 42nd Street, New York 17, New York

REPRESENTATIVES IN PRINCIPAL CITIES

PETROLEUM DERIVED CHEMICALS SERVING BASIC INDUSTRIES

VELSICOL

Looking for a "SPECIAL SOMETHING" in Reinforcing Pigments?

Columbia-Southern's® family of pigments possesses characteristics that frequently mean better compounding and lower volume costs.

There's one in this family that's probably ideally suited to your needs for white or light colored goods in a wide variety of rubber and vinyl plastic applications. Look over these descriptions and acquaint yourself with the individual properties.

For further information and working samples, contact our Pittsburgh office, Pigment Department.

	Bulk Density	Specific Gravity	Average Particle Size	Color	Free Moisture	Oil Absorption (Rub-in-method)	Typical Applications
CALCENE® TM Precipitated Calcium Carbonate (coated)	18±2 lbs./cu. ft.	2.5	0.1 micron	light cream	0.6% max.	30–40	Inner tubes, carcass stock, footwear, insulated wire and mechanical goods, heels, drug sundries
CALCENE NC Precipitated Calcium Carbonate (non-coated)	18±2 lbs./cu. ft.	2.7	0.1 micron	white	0.6% max.	40–50	
SILENE® EF Precipitated Calcium Silicate	10±2 lbs./cu. ft.	2.1	0.030 micron	white	0.6% max.	120–130	Soles, heels, wringer rolls
HI-SIL® 101 (formerly HI-SIL) Silica	8 lbs./cu. ft.	1.95	0.025 micron	white	4–7%	160	Super-soling, white belting or stock requiring good properties in a white or light color
HI-SIL 202 (formerly HI-SIL "C") Silica	6–8 lbs./cu. ft.	1.95	0.022 micron	white	4–7%	170–180	

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

District Offices: Cincinnati · Charlotte · Chicago
Cleveland · Boston · New York · St. Louis
Minneapolis · New Orleans · Dallas · Houston
Pittsburgh · Philadelphia · San Francisco

step-up your rubber processing with SOLKA-FLOC®

You can gain faster, easier production with SOLKA-FLOC – whether you manufacture floor tile or rubber soles – or any other rubber product.

For SOLKA-FLOC gives better results in your finished product – reduced blistering and nerve... controlled shrinkage... high dimensional stability... sharper designs ... harder, smoother surfaces.

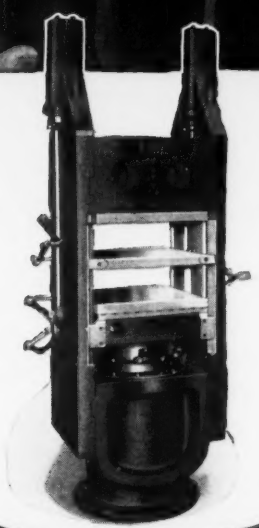
A finely-divided wood cellulose, SOLKA-FLOC will quickly solve your dispersion problems. Find out what it can do for you – to step-up production, improve your products, increase your profits. Send your processing problems to our Technical Service, Dept. GF-8, Boston office.

BROWN COMPANY, Berlin, New Hampshire
CORPORATION, La Tuque, Quebec

General Sales Offices:
150 Causeway Street, Boston 14, Mass.
Dominion Square Bldg., Montreal, Quebec

SOLKA AND CELLATE PULPS • SOLKA-FLOC • NIBROC PAPERS • NIBROC TOWELS • NIBROC KOWTOWLS • NIBROC TOILET TISSUE • BERMICO SEWER PIPE AND CONDUIT • ONCO INSOLES • CHEMICALS

300 TON ERIE Hydraulic Presses



Versatility in Rubber Molding

IN one of the Rubber Industry's largest plants, these 10 Erie 300 Ton Hydraulic Presses are molding a multitude of rubber products. Each Erie press shown here has four 3 ton pushback cylinders. Main rams are ground from chilled iron. Pushdown rams are of stainless steel. All glands and guides are bronze. Each press has two 6 inch openings and 24 inch by 24 inch platens. Nearly a half-century of engineering "know how" in designing Erie Foundry Company hydraulic presses is matched by unexcelled craftsmanship in producing this equipment for the rubber and plastics industry. Let Erie Foundry Company Engineers consult with you on your hydraulic press problems. Bulletin 350 gives full details on Erie Foundry Company Hydraulic Presses. Write for it.

ERIE
FOUNDRY COMPANY
HYDRAULIC PRESSES

ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

DETROIT 335 Curtis Building • CHICAGO 13 South Austin Blvd. • INDIANAPOLIS 2302 N. Meridian Street • NEW ENGLAND G. V. Eads, Kent, Conn.

Uniform quality in clay
is low cost insurance against "seconds"

There is only one...

Suprex

...*just one.* That's *always* top quality...always uniform. Carload after carload, year after year, Huber SUPREX Clay maintains its identical high quality, with the lowest guaranteed grit content and controlled, uniform color.

Huber's complete control during processing of the crude is your assurance of this consistent quality. You take no chance, entertain no doubts, when you specify Huber SUPREX.

Exacting laboratory tests at every stage of producing SUPREX—from its scientific prospecting and mining in South Carolina, through its processing by modern refining equipment—determine the uniform character which has firmly established SUPREX as the *standard* for the rubber industries.

ONE OF THE WORLD'S LARGEST CLAY PRODUCERS
Mines & Plants: Langley, Graniteville, South Carolina; Huber, Georgia

HUBER

J. M. HUBER CORPORATION
100 Park Avenue, New York 17, N. Y.

RUBBER AGE

One of the World's Outstanding Rubber Journals

VOLUME 75
NUMBER 5

M. E. LERNER
Editor

B. J. KOTSHER
Associate Editor

KENNETH T. CORELL
Production Manager

ELLA MAY DARRIN
Circulation Manager

CHARLES T. JANSEN
Advertising Manager

PETER P. PINTO
General Manager

MICROFILMS

Microfilm copies of complete volumes of RUBBER AGE are available from University Microfilms, 313 N. First St., Ann Arbor, Mich.

CONTENTS FOR AUGUST, 1954

Properties of Lactoprene BN-12.5, a Copolymer of Butyl Acrylate and Acrylonitrile, and its Vulcanizates — *By John E. Hansen and William E. Palm* 677

Manufacture of Bowling Balls at Stowe-Woodward 688

How to Get Best Results from Elevator Conveyor Belts—*By A. F. Matheis* 690

Unique Conveyor Belt System Employed in Goodrich Tire Plant 694

Division of Rubber Chemistry, A.C.S., Meets in New York on September 15-17, 1954: Abstracts of Papers 695

Reports on Avoidable Accidents in Rubber Factories 702

REGULAR DEPARTMENTS

Book Reviews	740	Los Angeles News	—
Canadian News	728	Names in the News	718
Chemical Prices	748	New Goods	732
Classified Ads	760	New Equipment	736
Coming Events	713	Obituaries	730
Editorials	703	Rubber, Cotton Markets	744
Financial News	720	Statistics	*

* Appears every other month

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing Office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R.I.

Midwestern Representative—LARRY M. LYONS, 549 West Washington St., Chicago 6, Ill. Phone: Central 6-0545.

News Correspondents—CARL S. HOGLUND, 5107 Telegraph Road, Los Angeles 22, Calif.—Phone: ANgelus 2-0117. PHIL GLANZER, Tivoli Theatre Bldg., Toronto 1, Canada.

Entered as Second Class Matter, October 20, 1933, at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $5.00 a year; Canada, $5.50; Foreign, $6.00. Single copies up to 3 months old, 50 cents; over 3 months old, 75 cents. Telephones: COlumbus 5-2923, 5-2924.

Contents Copyrighted 1954 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index and Engineering Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

Also Publishers of:

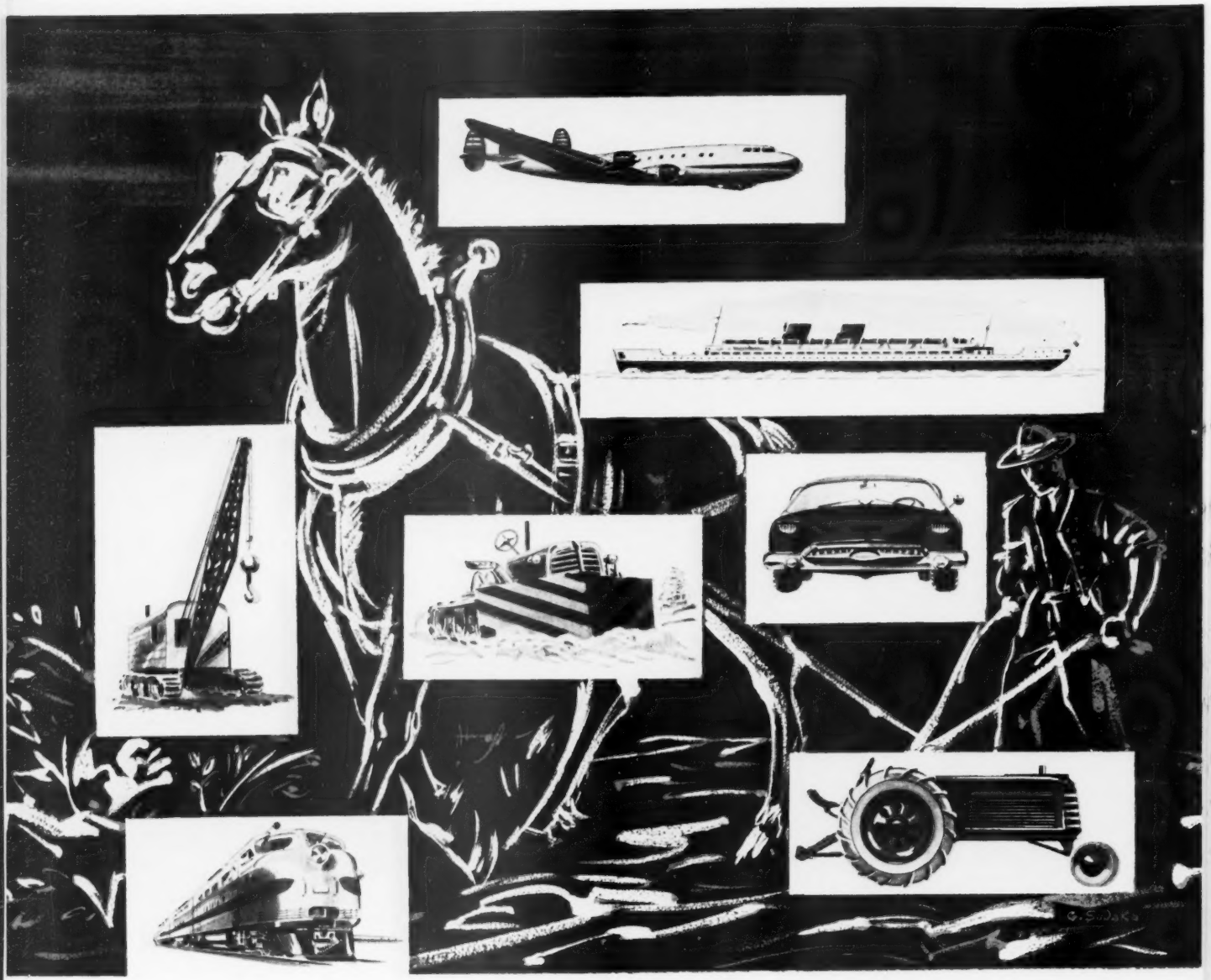
RUBBER RED BOOK
Directory of the Rubber Industry Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For Years 1935-1939

LATEX IN INDUSTRY
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
(Out of Print)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.



The new horsepower needs Paracril!

Steel, rubber, oil, and science have taken the horse out of horsepower—sent Dobbin the way of the kerosene lamp.

The *new* power is oil—oil that burns—oil that drives pistons and turbines in hydraulic systems—oil that lubricates moving parts to give the long reliable life essential to today's power equipment.

And Paracril® is the modern, oil-resistant chemical rubber that's outstanding for its ability to control the power of oil—in gaskets, seals, hydraulic hose and fittings, and a host of other applications where rubber-like properties are required.

Impervious to animal, vegetable, or mineral oils, fats, and greases, Paracril also provides excellent *abrasion resistance*, good *flexibility* over a wide temperature range, great *dimensional stability* and lasting *resilience*.

What's more, Paracril is available in three grades of oil-resistance, in bale or crumb form, and is extremely easy to process. It may be calendered, extruded, molded, or solvated for use in cements and adhesives—blended with plastics or other rubbers to impart special desirable properties.

See how Paracril can be an invaluable plus to *your* rubber products. Learn more about Paracril's many advantages by writing on your letterhead to the address below.

50TH ANNIVERSARY 1904 1954 NAUGATUCK CHEMICAL

Naugatuck Chemical

Division of United States Rubber Company

108 ELM STREET, NAUGATUCK, CONNECTICUT

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario

RUBBER CHEMICALS • SYNTHETIC RUBBER • PLASTICS • AGRICULTURAL CHEMICALS • RECLAIMED RUBBER • LATICES

RUBBER AGE

Vol. 75, No. 5 AUGUST, 1954

Properties of Lactoprene BN-12.5, a Copolymer of Butyl Acrylate and Acrylonitrile, and Its Vulcanizates

By JOHN E. HANSEN and WILLIAM E. PALM

Eastern Regional Research Laboratory, Philadelphia 18, Penna.

The knowledge gained in the development of Lactoprene EV, a copolymer of ethyl acrylate and chloroethyl vinyl ether, was used in developing another synthetic rubber designated Lactoprene BN, a copolymer of butyl acrylate and acrylonitrile. It may be prepared by the conventional polymerization techniques to yield a tack-free white product. The rubber can be handled on the ordinary rubber processing equipment and it bands readily when the rolls of the rubber mill are maintained at 150°F. By the proper choice of curatives, the vulcanizates exhibit outstanding resistance to heat and hot lubricating oils. The water resistance of the vulcanizates is significantly improved over that of Lactoprene EV, and the brittle points are substantially lower. This paper describes the properties of the vulcanizates obtained from a copolymer prepared from a monomer mixture of 87½% butyl acrylate and 12½% acrylonitrile. The properties of several commercially produced synthetic rubbers are included in this paper for purposes of comparison.

SEVERAL years ago this Laboratory published several papers *(1-8)* describing methods of preparing polymers and copolymers of ethyl acrylate which could be vulcanized with curatives frequently employed for diene rubbers. These early papers also summarized the chemical and physical properties of the vulcanizates. The most promising copolymer, ethyl acrylate and chloroethyl vinyl ether, designated Lactoprene EV, is now commercially available as Hycar PA-21.

The early studies demonstrated that conventional compounding facilities can be employed to incorporate the reinforcing agents and curatives. It was shown that several curatives and accelerators commonly used in the vulcanization of natural rubber and GR-S can be used with advantage with the saturated acrylic rubbers. However, an amine, Trimene Base, and sulfur recipe was found to impart outstanding resistance to dry heat. In addition, the low volume swelling of these vulcanizates in lubricating oils suggests many applications such as O-rings, gaskets, oil seals and similar mechanical goods.

These vulcanizates of Lactoprene EV exhibit certain limitations. For example, the brittle point, about +12°F., is relatively high and the swelling in water at 100°C., about 50% in 48 hours, is excessive. In an effort to correct these deficiencies the copolymers of butyl acrylate and acrylonitrile were investigated. A previous paper *(9)* summarized the preliminary data on several butyl acrylate-acrylonitrile compositions. The present paper describes the recently completed evaluation

Note: The Eastern Regional Research Laboratory is one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, United States Department of Agriculture.

TABLE I — OSMOTIC PRESSURE MOLECULAR WEIGHTS AND VISCOSITIES OF THE LACTOPRENE BN-12.5 COPOLYMERS

Sample No.	Molecular Weight [a]	Intrinsic Viscosity [a,b]
19 Q 1B1 [c]	1,760,000	——
T-302 [d]	901,000	5.46
T-306 [d]	780,000	3.38

(a) Acetone used as solvent. (b) Concentration in g./100 ml. (c) Prepared in Government Laboratories at the University of Akron. (d) Prepared in the Laboratory.

of the copolymer prepared from a monomer composition of 87½% butyl acrylate and 12½% acrylonitrile. This material has been designated Lactoprene BN-12.5 in accordance with the practice of the acrylic rubber development of this Laboratory. The number following the name indicates the amount of acrylonitrile in the monomer mixture.

Preparation and Characterization of the Raw Rubber

The procedure and the recipe employed for preparing these copolymers is substantially the same as that described in the previous publication *(9)*. A paper describing in greater detail the preparation of acrylic ester-acrylonitrile copolymers has recently been published *(10)*. The material used in this evaluation study was part of a pilot plant batch prepared in the Government Laboratories of the Office of Synthetic Rubber operated by the University of Akron. The recipe employed for this material was similar to those used in laboratory batches; however, a substantial amount of prefloc formed in the large reactor which did not form in the laboratory-prepared samples.

Acrylic monomers, because of their reactive double bond, polymerize readily into high molecular weight polymers. Frequently, insoluble products are formed which nevertheless can be compounded in the conventional manner. The solution polymerization, using benzene in moderate concentrations as a solvent, always yields a soluble polymer with high molecular weight. The emulsion method for the polymerization process frequently results in a polymer containing a low percentage of insoluble gel. Table I illustrates the osmotic pressure molecular weights and intrinsic viscosities for several polymers.

Compounding and Curing

Since these polymers are substantially saturated, the vulcanization process may not be the same as for the diene type rubbers. However, many curatives used in the vulcanization of these latter materials are also operative with acrylic rubbers. The experience gained in the development of Lactoprene EV indicated that the acrylic rubbers cured with an amine and sulfur should have good resistance to dry heat. These conclusions were substantiated in this study and Table II illustrates the recipes used in the evaluation of Lactoprene BN-12.5.

As with Lactoprene EV but in contrast to many diene polymers no initial breakdown is required. Furthermore, these acrylic copolymers band readily on the mill. There is a tendency for the materials to adhere to the rubber compounding rolls prior to the addition of the carbon black. In order to reduce the tendency for the stock to stick to the back roll, stearic acid is incorporated. Usually one part of stearic acid suffices and the rubber then remains on the front roll during compounding. In this study, however, we have employed an internal mixer for incorporating the filler and stearic acid. This is convenient since premastication is not necessary and the mixing schedule is shortened.

The following compounding scheme was found to be satisfactory for Lactoprene BN-12.5: The raw rubber is placed in the Banbury mixer maintained at 180°F. It is run at low speed (95 r.p.m. on the "Midget") for about one-half minute. The carbon black and stearic acid which have been superficially mixed are then added and the mixing continued for an additional two minutes at low speed. Mixing is continued for another three minutes at high speed (190 r.p.m. on the "Midget"). The compounded stock may tend to adhere to the mixer blades if the temperature rises too high. However, it can be readily removed by

TABLE II—THE EFFECT OF VARIOUS RATIOS OF TRIETHYLENE TETRAMINE AND SULFUR ON THE TENSILE PROPERTIES OF LACTOPRENE BN-12.5 VULCANIZATES CONTAINING FURNEX CARBON BLACK

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Lactoprene BN-12.5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Stearic acid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Semi-reinforcing furnace black (Furnex)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Sulfur	0	0.25	0.5	0.75	0	0.25	0.5	0.75	1	1	1	1	2	3	4	5	0
Triethylene tetramine	0.75	0.75	0.75	0.75	1	1	1	1	0.5	1	1.5	2	1	1	1	1	2
Initial Properties Cured 60 Minutes at 298°F.																	
Tensile strength, p.s.i.	790	1350	1380	1380	980	1310	1460	1490	NO CURE	1400	1370	1290	1360	1400	1370	1380	1390
Ultimate elongation, %	780	480	480	490	650	310	300	330		330	230	120	270	290	290	300	420
Shore A hardness (30 sec.)	36	44	48	46	40	54	55	55		55	60	71	59	60	59	60	46
Modulus at 100%	90	160	180	190	130	260	310	330		250	420	990	350	380	380	400	180
200%	230	390	480	480	290	740	860	830		720	1200	——	940	950	930	930	420
Aged 72 Hours at 350°F.																	
Tensile strength, p.s.i.	320	1200	1380	1450	460	1160	1390	1390	——	1300	1390	1650	1320	1390	1300	1350	710
Ultimate elongation, %	130	250	240	250	130	160	140	140	——	130	90	50	100	100	100	110	70
Shore A hardness (30 sec.)	60	64	62	62	61	68	76	76	——	73	80	91	80	80	79	80	75
Modulus at 100%	250	390	490	450	360	640	1000	940	——	1020	——	——	1300	1390	1300	1330	——

cooling. In general, the samples reach a temperature of about 300°F. at the end of this mixing cycle. The curing ingredients are then incorporated on the conventional rubber compounding rolls which are maintained at 150°F.

Advantage in Amine-Sulfur Recipe

The development of Lactoprene EV demonstrated the advantage gained in the improvement of resistance to dry heat using an amine-sulfur recipe. The preliminary evaluation of the acrylate-acrylonitrile copolymers *(9)* established the need of sulfur for a heat-resistant amine recipe. The sulfur is invariably added first to the carbon black-loaded stocks following a two minute milling cycle. The sulfur is usually dispersed in about two minutes. Finally triethylene tetramine is added. There is a tendency for the stock to split and stick to both rolls if the amine is added too quickly. However, once the triethylene tetramine is completely dispersed the stock remains on the front roll. The addition of the amine is usually completed in two minutes and the stock is then refined by closing the rolls and passing it through about six times. The rolls are then opened and the stock sheeted out to the proper thickness and allowed to cool. It should be kept in mind that this milling scheme has proved satisfactory in this study and is similar in many respects to the procedure developed for Lactoprene EV; it may not be the best industrially.

Satisfactory cures may be obtained in 15 to 60 minutes at 298°F. using the typical pressure molds as in A.S.T.M. Designation D15-41. The samples may also be vulcanized at 350°F. without appreciably affecting the final properties of the vulcanizates. Since the vulcanizates tend to adhere to the mold surface it is customary to use a mold release agent. Dow-Corning Mold Release No. 35*, when diluted 100 parts of water to one part of the mold release agent, has been found very effective. The diluted solution is brushed on the surfaces of the preheated mold and the excess wiped off lightly with a cloth. With this technique the cured test slabs were readily removed from the mold. In this evaluation study the compounded samples were vulcanized about 2 hours after compounding. The effect of storage of the compounded stocks at room temperature will be discussed.

Development of Test Recipes

Acrylic rubbers may be classed as specialty rubbers which are utilized in industrial applications where specific properties are required. Since these acrylic vulcanizates are apparently applicable where resistance to heat is of prime importance, this evaluation study was restricted to the determination of heat-resistant vulcanization recipes.

In order to facilitate the screening of the resistance to heat of the acrylic vulcanizates the tensile properties of the samples aged 72 hours in an air convection oven were obtained. Those stocks which did not suffer any significant change in their tensile strength compared with the initial tensile strength and still exhibited elongations of 100% or more were considered satisfactory and the vulcanizates were then given a more complete evaluation. The tensile tests obtained in this study were conducted according to ASTM specifi-

TABLE III—THE EFFECT OF VARIOUS RATIOS OF TRIETHYLENE TETRAMINE AND SULFUR ON THE TENSILE PROPERTIES OF LACTOPRENE BN-12.5 VULCANIZATES CONTAINING PHILBLACK O

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Lactoprene BN-12.5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Stearic acid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
High abrasion furnace black (Philblack O)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Sulfur	0	0.5	1.0	2	0	0.5	1.0	2	0	0.5	1.0	2	0	0.5	1.0	2	0.5	1.0	2	3	4	5
Triethylene tetramine	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	2	2	2	2	0.75	0.75	0.75	0.75	1	1
Initial Properties Cured at 60 Min. at 298°F.																						
Tensile strength, p.s.i.	1210	1180	1130	1100	1400	1710	1690	1830	1530	1660	1720	1790	1450	1440	1660	1780	1530	1650	1520	1630	1920	1790
Ultimate elongation, %	540	560	650	670	450	270	270	300	420	420	170	180	450	110	110	130	450	440	500	410	380	370
Shore A hardness (30 sec.)	55	56	54	55	56	60	68	69	58	77	77	76	55	80	81	83	60	60	60	61	65	65
Modulus at 100%	260	250	260	250	280	520	510	520	260	870	970	940	210	1290	1420	1450	400	400	390	450	400	480
200%	590	570	570	500	590	1200	1190	1200	600	——	——	——	490	——	——	——	770	820	750	870	1000	990
Aged 72 Hours at 350°F.																						
Tensile strength, p.s.i.	980	1430	1450	1450	810	1550	1710	1910	710	1710	1760	1870	TO BRITTLE TO TEST				1560	1650	1500	1620	1790	1780
Ultimate elongation, %	320	460	500	450	140	140	140	150	80	80	70	70					300	270	290	250	160	170
Shore A hardness (30 sec.)	60	64	65	65	74	81	84	84	81	90	90	91					72	74	75	77	85	87
Modulus at 100%	400	410	430	430	610	1210	1240	1230	——	——	——	——					560	620	570	630	1180	1160

* Mention of commercial names in this paper does not imply endorsement by the Department of Agriculture over similar products not named.

TABLE IV—THE EFFECT OF VARIOUS RATIOS OF TRIETHYLENE TETRAMINE AND SULFUR ON THE TENSILE PROPERTIES OF LACTOPRENE BN-12.5 VULCANIZATES CONTAINING P-33 AND WYEX CARBON BLACKS

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Lactoprene BN-12.5		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Stearic acid		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fine thermal furnace black—P-33		100	100	100	100	100	100	100	100	—	—	—	—	—	—	—	—
Easy processing channel black—Wyex		—	—	—	—	—	—	—	—	50	50	50	50	50	50	50	50
Sulfur		1.0	1.0	1.0	1.0	0	0.5	2	3	1.0	1.0	1.0	1.0	0	0.5	2	3
Triethylene tetramine		0.5	1.0	1.5	2	1.0	1.0	1.0	1.0	1.0	1.5	2	2.5	2	2	2	2
Initial Properties Cured 60 Min. at 298°F.																	
Tensile strength, p.s.i.	N	1520	1640	1550	1070	1540	1380	1460	940	1250	1480	1580	1200	1220	1420	1480	
Ultimate elongation, %	O	440	310	190	630	340	370	390	700	450	300	240	460	420	240	260	
Shore A hardness (30 sec.)	C	53	63	71	45	60	59	59	50	60	70	73	56	64	68	68	
Modulus at 100%	U	220	390	720	170	370	280	290	280	430	630	810	410	490	780	780	
200%	R	590	980	—	310	800	620	660	540	790	1140	1390	710	780	1290	1290	
	E																
Aged 72 Hours at 350°F.																	
Tensile strength, p.s.i.	—	1190	1310	1510	800	1140	1190	1230	890	1050	1300	1390	670	1070	1380	1340	
Ultimate elongation, %	—	190	110	60	180	120	150	150	220	170	110	80	110	160	90	90	
Shore A hardness (30 sec.)	—	70	82	91	68	82	80	80	69	78	85	90	72	80	86	86	
Modulus at 100%	—	610	1300	—	460	1000	840	880	600	820	1250	—	670	880	—	—	

cations D-412-41 using a die similar to Die D except that the reduced section was ¼-inch wide.

Tables II, III and IV show the effect of various ratios of sulfur and triethylene tetramine on the initial tensile properties with four carbon black fillers—Furnex, Philblack O, P-33 and Wyex. The carbon black loadings used in this study were restricted to those illustrated in the tables. A previous inspection showed that these carbon black concentrations gave adequate reinforcement; however, other carbon black loadings may result in stocks superior to those described in this paper.

These tables also show the change in properties on heat aging in an air convection oven. As can be seen, it is possible to obtain satisfactory vulcanization in the absence of sulfur but on exposure to temperatures of 350°F. there is an inordinate decrease in the tensile strength of the vulcanization regardless of the type of carbon black filler used. See for example Table II recipes A, E and Q; Table III recipes A, E and I; and Table IV recipes E and M.

The incorporation of relatively small amounts of sulfur, for example Table II recipes B and F, yields vulcanizates which retain virtually completely their original tensile strength on aging. For those stocks containing Philblack O (Table III) satisfactory cures are obtained with only 0.5 parts of triethylene tetramine. Tables II, III and IV show that high concentrations of triethylene tetramine should be avoided for the best retention of tensile properties and furthermore that high concentrations of sulfur apparently do not impart any additional resistance to heat.

It should be noted, however, that low concentrations of sulfur accelerate the vulcanization process. This is borne out by comparing recipes A and B in Table II. The addition of only 0.25 part of sulfur while the triethylene tetramine concentration is constant at 0.75 part increases the tensile strength from 790 to 1350 p.s.i. while the elongation decreases from 780 to 480%. By compromising between the best initial tensile properties and the best heat aged tensile properties several recipes were chosen for extensive evaluation. These recipes are: Table II G and J, Table III F and U, and Table IV B and K. This provided two recipes containing Furnex, two recipes containing Philblack O, and one recipe each for P-33 and Wyex blacks. Philblack O loaded stocks containing a minimum of curative, 0.5 part of triethylene tetramine in recipes B, C, and D in Table III, have

TABLE V—EFFECT OF CURE TIME ON INITIAL PROPERTIES

Sample	G(II)*	G(II)	G(II)	G(II)	J(II)	J(II)	J(II)	J(II)	F(III)	F(III)	F(III)	F(III)
Cure Time (mins.) at 298°F.	15	30	60	120	15	30	60	120	15	30	60	120
Tensile strength, p.s.i.	1430	1500	1500	1540	1470	1470	1470	1540	1690	1790	1670	1620
Ultimate elongation, %	320	270	250	200	320	260	260	190	380	330	280	220
Modulus at 100%	270	340	370	600	280	380	360	690	380	430	530	720
Shore A hardness (30 sec.)	54	58	60	62	54	56	60	63	60	65	69	71

Sample	U(III)	U(III)	U(III)	U(III)	B(IV)	B(IV)	B(IV)	B(IV)	K(IV)	K(IV)	K(IV)	K(IV)
Cure Time (mins.) at 298°F.	15	30	60	120	15	30	60	120	15	30	60	120
Tensile strength, p.s.i.	1560	1750	1790	1840	1430	1380	1460	1570	1640	1760	1600	1720
Ultimate elongation, %	420	390	310	270	320	350	290	270	340	350	420	270
Modulus at 100%	360	390	480	590	380	400	490	600	480	500	460	740
Shore A hardness (30 sec.)	64	65	68	74	58	64	66	66	62	64	70	70

* The letter indicates the recipe for preparing the vulcanizate and the number in parentheses indicates the table where the recipe may be located.

outstanding heat resistance as exemplified by the fact that the vulcanizates still exhibited better than 450% elongation after aging for 72 hours at 350°F. Since many of the small laboratory batches of Lactoprene BN-12.5 did not yield satisfactory cures with this low concentration of triethylene tetramine it was decided to use higher amine concentrations in the evaluation study.

Table V shows the change in the initial tensile properties of the vulcanizates obtained with the selected recipes for curing times from 15 minutes to 120 minutes. These data show that for the various recipes 15 minutes at 298°F. results in vulcanizates which are sufficiently cured for many applications. In this study, therefore, the vulcanizates of Lactoprene BN-12.5 were cured for 15 minutes at 298°F.

Comparison with Other Synthetic Rubbers

For a proper comparison of the properties of Lactoprene BN-12.5 vulcanizates with other commercially available rubbers it was deemed advisable to actually evaluate the latter vulcanizates with those of Lactoprene BN. The following rubbers were included in this study: Paracril 18-80, Hycar OR-15, Hycar OR-25, Perbunan 26, and Hycar PA-21. The recipes and processing techniques employed were usually those recommended by the manufacturer for heat resistant applications. These recipes are presented in Table VI along with the initial tensile properties of the cured test slabs. These vulcanizates were subjected to the same experimental conditions and at the same time as the acrylic elastomer.

Resistance to Dry Heat

An intensive study of the resistance to dry heat of Lactoprene BN-12.5 vulcanizates was undertaken. The deterioration due to heat was studied in both an air-convection oven at 300° and 350°F. and in an enclosed system at 350° and 400°F. The change in the tensile properties such as tensile strength, elongation, modulus, and durometer hardness was observed over extended periods of time. Dumbbell samples cut from the test slabs were either hung in the oven or hung on racks in sealed containers. No attempt was made to remove or displace the residual air in the containers. Periodically samples were removed for testing. The commercial rubbers were evaluated similarly in the air convection oven at 300°F. and at 350°F. in the sealed containers.

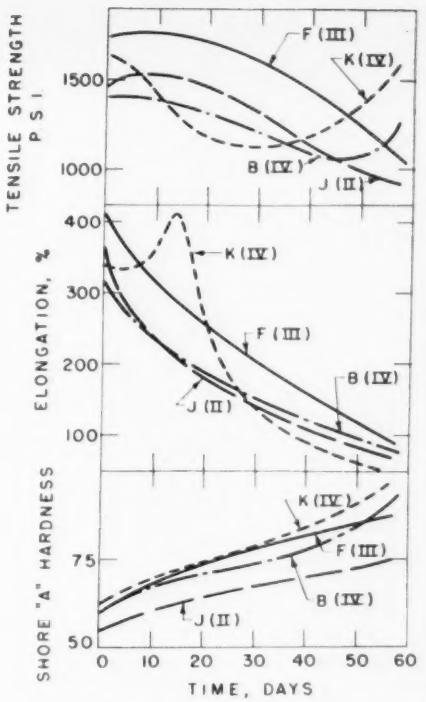


FIG. 1—Heat aging of Lactoprene BN-12.5 vulcanizates in an air-convection oven at 300°F.

Figure 1 shows the change of the tensile strength, elongation and hardness of the Lactoprene BN-12.5 vulcanizates, containing four different reinforcing agents, to dry heat at 300°F. for various times up to 56 days. Both the Furnex and Philblack O-loaded stocks show essentially a gradual lowering of tensile strength and elongation and a gradual increase in durometer hardness. At the end of 56 days at 300°F. the stocks still retained tensile strengths in excess of 900 p.s.i. and elongations better than 70%. The durometer hardness of the two stocks increased from an initial value of 55 and 60, respectively, to 75 and 85, respectively, at the end of 56 days' exposure. The P-33-loaded stocks show a similar decrease in tensile strength and elongation and a gradual increase in hardness. The Wyex stocks, however, showed a rather rapid decrease in tensile strength which remained approximately constant for about three weeks and then a rapid increase in tensile strength. The tensile strength of the Wyex stocks was initially 1640 p.s.i. and decreased to about 1120 p.s.i. at the end of 35 days; however, at the end of 56 days the tensile strength increased to 1760 p.s.i. The elongation of the Wyex stocks exhibited an initial elongation of 340% and increased to 410% in 14 days; subsequently, the elongation decreased most rapidly of the variously loaded stocks to a value of 50% at the end of the test. In addition, the Wyex stocks showed the greatest increase in hardness of the four reinforcing agents studied.

The change in the physical properties of the other rubbers studied in the air-convection oven at 300°F. are shown in Figure 2. With the exception of Hycar PA-

TABLE VI—RECIPES AND INITIAL TENSILE PROPERTIES OF COMMERCIAL RUBBERS USED IN THIS STUDY

Recipe	Paracril 18-80	Hycar OR-25	Hycar OR-15	Perbunan 26	Hycar PA-21
Rubber	100	100	100	100	100
Stearic acid	1	—	1	1	1
Furnex	54	70	60	54	50
Agerite Resin D	2	2	—	2	—
Methyl Tuads	3	2	—	3	—
Santocure	—	1	—	—	—
Altax	—	—	1.5	—	—
Zinc oxide	5	5	5	5	—
Sulfur	—	0.5	1.5	—	0.5
Trimene Base	—	—	—	—	3
Cure Time (Min.)	60	45	30	60	45
Temperature (°F.)	287	310	310	287	310
	Initial Properties				
Tensile strength, p.s.i.	2120	2550	2370	2140	1370
Elongation, %	510	260	310	550	190
Modulus at 100%, p.s.i	210	740	510	200	700
Shore A hardness (30 sec.)	60	75	71	63	69

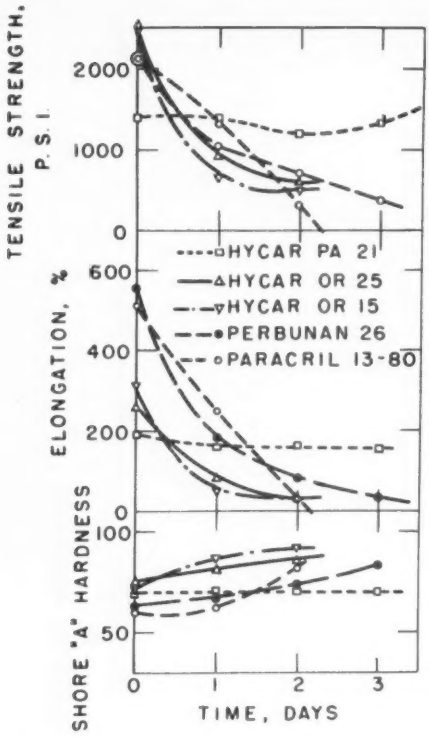


FIG. 2—Heat aging of commercial rubbers in an air-convection oven at 300°F.

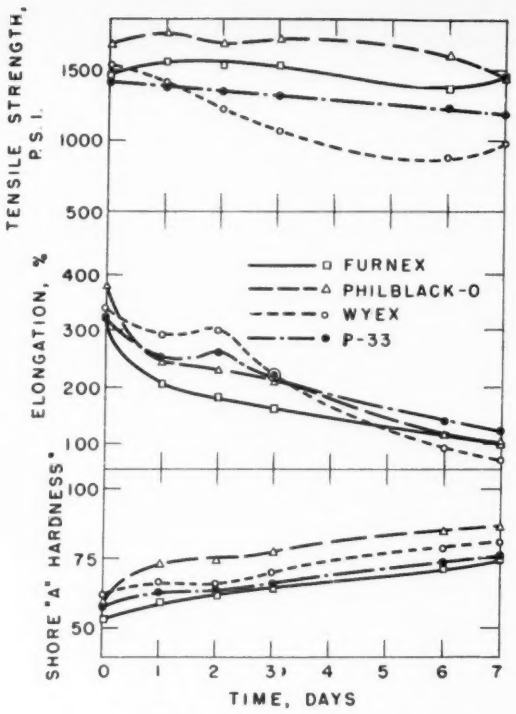


FIG. 3—Heat aging of Lactoprene BN-12.5 vulcanizates in an air-convection oven at 350°F.

21, all the samples had deteriorated at the end of four days to such an extent that they could not be tested.

At an even higher temperature, 350°F. in the air-convection oven, the Lactoprene BN-12.5 vulcanizates exhibited the change in physical properties shown in Figure 3. The Wyex-loaded vulcanizates showed the greatest decrease in tensile strength while the Furnex, Philblack O, and P-33-loaded vulcanizates showed very little change at the end of seven days. The elongations of these vulcanizates decreased to about 100% at the end of the exposure while the durometer hardness of the vulcanizates increased about 20 points above the initial hardness values.

Since the exposure of the samples to heat in the air-convection oven does not approach the actual service conditions where these materials may find ultimate utility, such as gaskets, oil seals, and O-rings, the vulcanizates were placed in sealed containers and exposed for various lengths of time to temperatures of 350° and 400°F. It was felt that the above applications confine the samples of rubber so that air oxidation or the loss of oxidation inhibitors is minimized. Therefore, these conditions are more nearly simulated by exposing the samples to heat in an enclosed system.

Figure 4 illustrates the change in some of the tensile properties of the vulcanizates on exposure in sealed vessels to temperatures of 350°F. As can be seen, there is little change in either the tensile strength or elongation in the two differently reinforced stocks in 28 days while there is only a slight increase in the hardness values. There is materially less change in these tensile data than those obtained from samples exposed to 300°F. in the air-convection oven (see Figure 1).

Figure 5 illustrates the effect of 350°F. aging for the commercial rubbers under identical conditions. At the end of 15 days all the samples exhibited elongations of 50% and were in general so brittle that they could not be clamped in the tensile tester. The length of time to reach this state of deterioration was again consid-

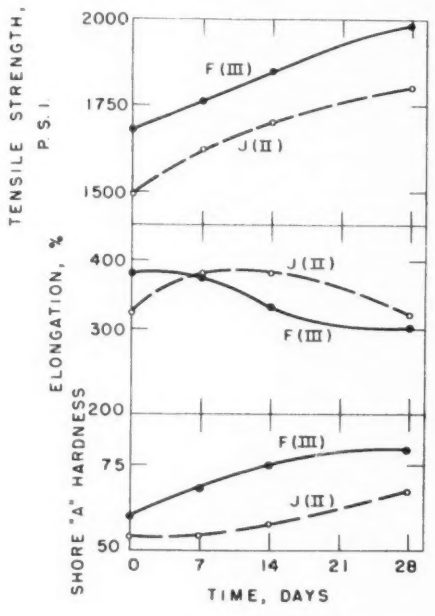


FIG. 4—Heat aging of Lactoprene BN-12.5 vulcanizates in sealed containers at 350°F.

erably extended from that obtained at 300°F. in the air-convection oven (see Figure 2).

The effect of aging of the Lactoprene BN-12.5 vulcanizates at 400°F. in a sealed system is shown in Figure 6. The change in the tensile strength, elongation, and hardness are illustrated for samples exposed to 400°F. for various lengths of time in sealed vessels up to 28 days. For comparison, the data obtained for a silicone rubber vulcanizate is included. The Lactoprene BN stocks still retained tensile strengths better than 1300 p.s.i. and elongations somewhat greater than 150% after 28 days' exposure. The durometer hardness values increased about 20 points. The silicone rubber, designated G-E 12660 (kindly supplied by the General Electric Company), shows a much less percentage change in the tensile properties; however, its tensile strength and elongation are substantially lower than the acrylate-acrylonitrile vulcanizates.

Resistance to Hot Lubricating Oils

An intensive study of the oil resistance of Lactoprene BN-12.5 vulcanizates was also undertaken. The volume change as measured by the precent change in volume of rectangular specimens suspended in the ASTM Oils Numbers 1, 2 and 3 and a commercial automatic transmission oil at 300° and 350°F. was determined over a period of 28 days. In addition, the change in the tensile properties of dumbbells suspended in the hot oils was also determined. The latter oil, because of its exposure to extremely high temperatures, contains a number of additives to increase its useful life; unfortunately, many of these additives are extremely deleterious to most rubbers. This oil was included therefore to observe its effect on the Lactoprene BN vulcanizates.

It should be borne in mind that under the conditions of this test two effects are operating simultaneously. One is the effect of the elevated temperature upon the deterioration of the rubber which has been described in the previous section. The specimens immersed in the hot lubricating oils may be considered in a similar environment as those samples exposed to dry heat in the enclosed systems. However, the rate of chain scission and cross-linking in the oils, in comparison to these rates in the simple heat aging, is complicated by the additional action of the oil and its decomposition products on the vulcanizates. The change in tensile properties with immersion time in hot oils was used in this investigation as a criterion of the deterioration of the vulcanizates due to the heat and oil. The second effect is the volume swelling of the rubber in the hot oils. This is a thermodynamic property depending upon the number of cross-links and the polymer-oil interaction. It is beyond the scope of this paper to discuss the thermodynamic properties of this acrylic rubber.

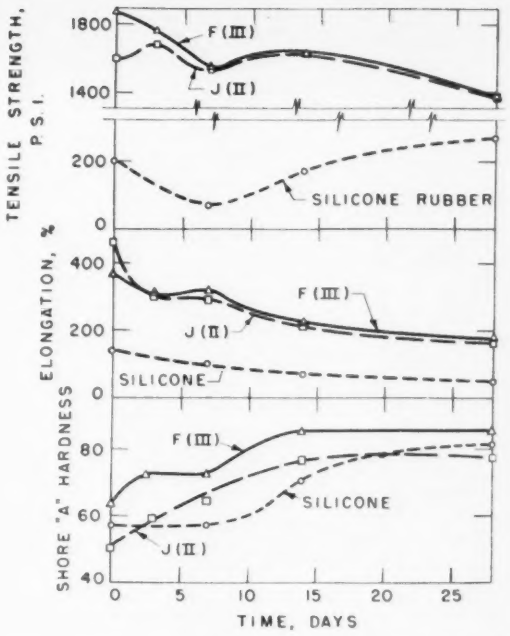


FIG. 6—Heat aging of Lactoprene BN-12.5 vulcanizates and a silicone rubber in an enclosed system at 400°F.

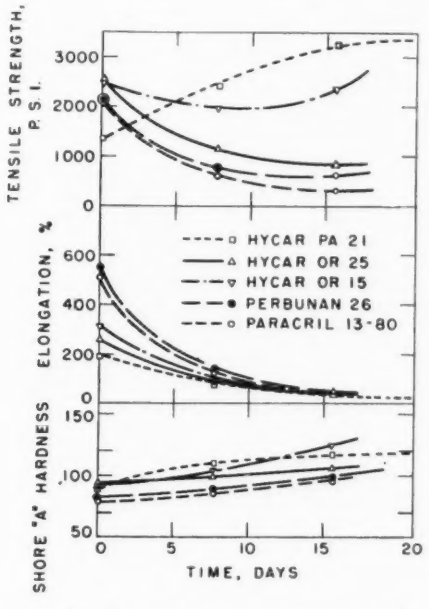


FIG. 5—Heat aging of commercial rubbers in sealed containers at 350°F.

Test dumbbells were prepared from the same test slabs as used in the heat aging studies. Rectangles 1-inch x 1½-inch cut from these slabs were used in the volume swelling determinations. This latter determination was performed following the procedure described in ASTM designation D471-46T. Furthermore, the oil was discarded every seven days and then replaced with fresh oil.

The percent volume increase and tensile data for four commercial rubbers are presented in Table VII. The samples were immersed in the lubricating oils up to 28 days at 300°F. The data in Table VII show some of the initial tensile properties of the vulcanizates and the tensile properties and volume swelling for two immersion times. At the end of 28 days the Lactoprene rubbers showed an increase in volume swelling of about 2% in ASTM Oil No. 1 between 9 and 12% in ASTM Oil No. 2, between 27 and 36% in ASTM Oil No. 3, and between 11 and 16% in the commercial automatic transmission fluid. Furthermore, the tensile strength and elongations of the acrylate vulcanizates were consistently high, showing negligible deterioration un-

TABLE VII—VOLUME SWELLING AND TENSILE PROPERTIES OF VULCANIZATES IMMERSED IN VARIOUS OILS AT 300° F.

Sample Designation	Initial Properties			Length of Time Immersed	ASTM No. 1 Oil			ASTM No. 2 Oil			ASTM No. 3 Oil			Commercial Automatic Transmission Fluid		
	T.S.[b]	E.[c]	H.[d]		T.S.	E.	H.	V.S.[e]	T.S.	E.	H.	V.S.	T.S.	E.	H.	V.S.
J(II)[a]	1580	420	52	70 hours	1780	230	64	4.0	1500	210	60	12.0	1130	190	55	34.2	1450	220	56	16.0
				28 days	1290	320	62	2.8	1230	340	48	12.0	840	330	44	35.6	1250	360	50	14.6
F(III)	1690	430	61	70 hours	2040	260	70	4.0	1900	250	60	12.4	1260	250	57	25.5	1620	270	61	16.0
				28 days	1570	300	71	2.8	1500	340	62	12.0	960	340	50	36.4	1400	360	61	15.2
B(IV)	1380	260	62	70 hours	1250	330	65	3.2	1140	420	60	11.2	850	430	55	29.5	1100	500	57	13.4
				28 days	1340	250	69	1.8	1100	350	63	9.2	780	370	55	27.6	1000	390	61	11.2
K(IV)	1570	320	66	70 hours	1550	230	70	3.8	1350	250	65	13.4	920	200	60	35.2	1250	280	63	16.0
				28 days	1460	220	76	2.6	1330	260	65	11.2	840	250	57	35.8	1200	290	61	14.8
Hycar OR-25	2550	260	75	14 days	2380	220	74	—2.0	1470	160	75	4.2	750	130	68	14.5	B L A N K			
				28 days	1890	150	76	—2.5	560	80	74	3.1	480	100	71	14.2	720	100	71	5.3
Hycar PA-21	1370	160	69	14 days	1390	140	79	—1.4	1580	150	76	3.0	1370	180	67	13.3	—	—	—	—
				28 days	1510	110	81	—1.7	1540	130	79	2.4	1410	160	75	12.5	1470	140	76	5.0
Hycar OR-15	2470	310	71	14 days	2760	230	78	—2.2	820	90	76	1.2	610	100	75	7.6	—	—	—	—
				28 days	1370	110	80	—1.6		B L A N K				B L A N K			690	90	80	1.2
Perbunan 26	2140	550	63	14 days	2170	390	59	0.8	1810	350	54	13.2	1210	350	45	33.8	—	—	—	—
				28 days	840	170	62	1.0	400	130	55	12.6	410	140	51	30.0	180	120	47	12.6

(a) Symbol denotes the table in paper and recipe for preparing vulcanizate. (b) Tensile strength in lbs. per sq. in. (c) Percent elongation. (d) Shore A hardness (30 sec.). (e) Volume swelling, %.

der these conditions. The commercial rubbers tested, with the exception of Hycar PA-21, exhibited a substantial decrease in tensile properties at the end of the test, particularly in the automatic transmission fluid.

Table VIII summarizes the volume swelling and tensile data obtained on the vulcanizates immersed in ASTM Oils Nos. 1 and 2 at 350°F. At this temperature, as above, the samples were immersed up to 28 days and data are shown for two immersion times. Only two Lactoprene vulcanizates were employed in this study at this temperature, sample numbers J (II) and F (III), loaded with Furnex and Philblack O, respectively. The Lactoprene rubbers showed very little deterioration at this temperature since both the tensile strengths and elongations remained fairly high up to 28 days. On the other hand, the elongations of the commercial rubbers (including Hycar PA-21) were extremely low at the end of the test.

Compression Set

Low compression set is extremely important for rubber vulcanizates to be employed in applications such as gaskets, O-rings, and similar mechanical goods. Since acrylate rubbers such as Lactoprene EV (Hycar PA-21) are being used in such applications, it is anticipated that these new acrylate-acrylonitrile rubbers should also provide material for similar mechanical specialties. Table IX summarizes the compression set data obtained on the four representative Lactoprene BN-12.5 vulcanizates and the four comparative rubbers tested at 250°F. for 70 hours.

The second column in the table shows the results obtained on the unaged vulcanizates. It shows that the compression set is inordinately high for the four Lactoprene BN-12.5 and Hycar PA-21 vulcanizates while two of the comparative rubber vulcanizates are low. However, since the Lactoprene rubbers have outstanding resistance to dry heat they may be conveniently aged or tempered in an air-convection oven for a short time prior to the compression set determination. This is common practice these days in the fabrication of certain specialty rubbers. This practice is unsatisfactory with most other rubbers because of their relatively poor heat resistance. The table shows that aging the vulcanizates substantially improves the compression set and that tempering for 24 hours at 350°F. in an air-convection oven is approximately the optimum condition, since longer exposure to this high temperature will affect the useful life of the rubber.

TABLE IX—COMPRESSION SET[a] OF THE LACTOPRENE BN-12.5 VULCANIZATES AND COMMERCIAL RUBBERS

Sample Designation	Initial Value	Tempered 2 hrs. at 300°F.	Tempered 2 hrs. at 350°F.	Tempered 24 hrs. at 300°F.	Tempered 24 hrs. at 350°F.
J(II)[b]	80.7	56.7	45.7	37.7	29.7
F(III)	92.1	73.7	—	51.5	40.4
B(IV)	77.6	—	—	49.5	47.9
K(IV)	86.8	—	—	59.5	54.3
Hycar OR-25	39.0	—	—	—	—
Hycar PA-21	93.4	—	—	42.1	—
Hycar OR-15	83.1	—	—	—	—
Perbunan 26	34.1	—	—	—	—

(a) ASTM D-395-47-T, Method B. (b) Symbol denotes recipe and table for preparing vulcanizate.

TABLE VIII—VOLUME SWELLING AND TENSILE PROPERTIES OF VULCANIZATES IMMERSED IN ASTM OILS NOS. 1 AND 2 AT 350° F.

Sample Designation	Initial Properties T.S.[b]	E.[c]	H.[d]	Length of Time Immersed	ASTM No. 1 Oil T.S.	E.	H.	V.S.[e]	ASTM No. 2 Oil T.S.	E.	H.	V.S.
J(II)[a]	1370	530	49	14 days	1700	320	60	0.1	1580	240	60	10.3
				28 days	1840	200	68	—1.9	1620	220	60	8.6
F(III)	1200	570	56	14 days	1880	310	60	0.6	1720	350	61	11.1
				28 days	1870	270	75	—0.2	1380	260	65	10.3
Hycar OR-25	2170	230	73	14 days	2200	120	81	—3.2	1170	90	76	4.2
				28 days	1870	70	88	—1.9	1470	60	85	4.3
Hycar PA-21	1250	220	64	14 days	2080	60	94	—7.0	2060	60	91	—3.8
				28 days	2830	50	98	—10.4	2570	50	95	—6.9
Hycar OR-15	2290	310	70	14 days	2350	120	84	—3.9	2100	100	80	0.1
				28 days	3490	90	92	—2.6	2500	70	90	0.9
Perbunan 26	2320	660	59	14 days	1670	180	67	—0.9	590	110	60	13.2
				28 days	1600	110	78	+0.4	710	80	70	13.3

(a) Symbol denotes the table in paper and recipe for preparing vulcanizate. (b) Tensile strength, lbs. per sq. in. (c) Percent elongation. (d) Shore A hardness (30 sec.). (e) Volume swelling, %.

Water Resistance

One of the deficiencies of Lactoprene EV vulcanizates is its large volume swelling in water at 212°F. These new acrylate-acrylonitrile rubbers were developed to partially overcome this defect. It is therefore appropriate to summarize the data obtained on the water resistance of these vulcanizates. The percent volume increase in the water was determined by the procedure suggested by ASTM D471-46T.

Figure 7 illustrates the data obtained on the four Lactoprene BN-12.5 stocks employed in this study and the data obtained on the four comparative rubbers. The bottom of the graph shows the data for the green or untempered vulcanizates immersed in distilled water at 212°F. up to 28 days. The samples J (II), F (III), and B (IV), Furnex, Philblack O and P-33-loaded stocks, respectively, exhibited a percent volume increase of about 15% at the duration of the test. Sample K (IV), the Wyex stock, exhibited a volume increase of 28% at the end of 28 days.

The upper part of Figure 7 shows the data obtained for the comparative rubbers. The two Hycar OR samples exhibited a volume swelling below 5% while the Perbunan 26 vulcanizate developed a volume swelling of about 18% under similar conditions. The Hycar PA-21 sample, an acrylate rubber, developed a volume swelling of almost 120% in the same length of time.

The percent volume increase of the Lactoprene BN-12.5 vulcanizates tempered 24 hours at 300°F. is also illustrated in Figure 7. Since the compression set study demonstrated the need for aging the vulcanizates in an oven at elevated temperatures to insure minimum curing while the stocks are subjected to a compressive load, it was considered desirable to extend the water resistance study to the tempered samples. It is apparent from the graph that this heat treatment adversely affects the water resistance of these vulcanizates. At the end of the 28 day immersion in water at 212°F., the samples J (II) and B (IV), the Furnex and P-33-loaded stocks respectively, each exhibited an increase in the volume swelling to about 35%. The F (III) sample containing Philblack O swelled about 45% and the K (IV) sample containing Wyex swelled to about 60%. These volume swellings are substantially higher than for the untempered samples.

Table X summarizes some of the tensile data obtained on the stocks prior to their immersion in distilled water and at the end of the immersion period. The tensile strength and elongations of the Lactoprene BN-12.5 vulcanizates were substantially lower than for the stocks before immersion. The diene rubber samples, such as Hycar OR-25, Hycar OR-15 and Perbunan 26, on the other hand, showed only negligible changes in tensile properties. The Hycar PA-21 rubber, however, because

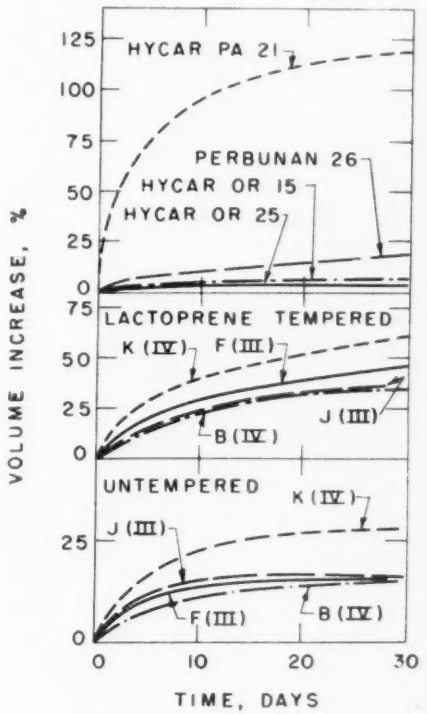


FIG. 7—Volume swelling of Lactoprene BN-12.5 vulcanizates and commercial rubbers in water at 212°F.

TABLE X—TENSILE PROPERTIES OF LACTOPRENE BN-12.5 VULCANIZATES AND COMMERCIAL RUBBERS

Sample Designation	Initial Properties —Untempered—			Tensile Properties —Tempered 24 hrs. at 300°F.			Tensile Properties after Aging 28 Days in Water at 212°F. —Untempered—			—Tempered 24 hrs. at 300°F.		
	T.S.[b]	E.[c]	H.[d]	T.S.	E.	H.	T.S.	E.	H.	T.S.	E.	H.
J(II)[a]	1600	460	50	1700	300	56	1020	130	62	800	170	58
F(III)	1880	370	63	1930	250	67	1330	130	72	800	160	60
B(IV)	1430	320	58	1380	260	62	1000	210	64	710	180	59
K(IV)	1640	340	62	1570	320	66	1020	100	68	710	140	59
Hycar OR-25	2550	260	75	—	—	—	2680	220	76	—	—	—
Hycar PA-21	1370	190	69	—	—	—	380	100	54	—	—	—
Hycar OR-15	2470	310	71	—	—	—	2600	210	79	—	—	—
Perbunan 26	2140	550	63	—	—	—	2040	450	62	—	—	—

(a) Symbol denotes recipe and table for preparing vulcanizates. (b) Tensile strength, p.s.i. (c) Ultimate elongation, %. (d) Shore A hardness (30 sec.).

of its high volume swelling, showed the greatest decrease in tensile properties.

Brittle Points

The most serious deficiency of Lactoprene EV vulcanizates originally developed at this Laboratory is the relatively high brittle point. This defect more than any other probably limits its utility since it restricts the number of applications where it may be employed. The use of butyl acrylate in place of ethyl acrylate as one of the co-monomers in the preparation of Lactoprene BN substantially lowers the brittle point of the vulcanizates.

Table XI summarizes the brittle point data obtained on the vulcanizates for a number of different exposure conditions as well as the initial brittle point of the unexposed samples. In addition, the brittle points of the comparative rubbers are included in the table. In the aging experiments of the Lactoprene samples at 300°F. in the air-convection oven, no significant change in the brittle points was observed in 72 hours. The Furnex-loaded stock had an initial brittle point of —11°F.; after 72 hours at 300°F., the observed brittle point was —15°F. At the end of four weeks, however, in the air-convection oven the brittle point was found to be +5°F. The Philblack O stock changed from an initial brittle point of —7°F. to +10.5°F. at the end of the four-week exposure.

The change in the brittle points of the comparative rubbers, with the exception of Hycar PA-21 which is an acrylic rubber and has a high brittle point initially, is much more pronounced. The Hycar OR-25 had a brittle point of —28.5°F. initially while at the end of 72 hours the brittle point increased to +23°F. The Hycar OR-15 had a brittle point initially of —4°F. which increased to above +36°F. in 24 hours. The Perbunan 26 rubber had initially a brittle point of —60°F. which increased to +8.5°F. in 72 hours. At 350°F. in the air-convection oven the Furnex and Philblack O stocks showed only a slight increase in the brittle point at the end of 72 hours. The brittle points of the samples aged in the various ASTM oils and the automatic transmission fluid showed a similar trend; however, the total change was not as great as in the air aging. In the oils as well the diene comparative rubbers exhibited the most pronounced change in brittle points.

Many specifications for rubber items to be used in the construction of mechanical goods require that the rubber have an extremely low brittle point. The brittle point is usually determined on the green stock which has not been exposed to any of the conditions which the rubber sample may encounter in service. These brittle point data suggest that a rubber with a slightly higher brittle point but with superior heat and oil resistance may be far superior in performance.

Effect of Storage of Compounded Stock

In order to expedite the evaluation of this new elastomer, the compounded stock was usually vulcanized about two hours after milling. This is not the recommended practice in rubber technology; usually, the milled stock is vulcanized 24 hours after compounding. Since this preferred technique was not followed, a study of the effect of storage on the compounded Lactoprene BN stock was not undertaken. The data in Table XII is typical of the data obtained from various storage experiments.

In these experiments, the butyl acrylate-acrylonitrile copolymer was generously supplied by the American Monomer Corporation and therefore this material was prepared under different experimental conditions from the copolymer used in the evaluation study. However, similar observations were observed with the copolymer prepared at the Government Evaluation Laboratory. The data presented in Table XII were obtained from vulcanizates prepared from the same recipe as F (III) with a curing time of 15 minutes at 300°F. for all the test samples. In all the experiments there appeared a significant lowering of the tensile strength and modulus in the first 24 hours. For the next three or four days the tensile properties remained fairly constant and then a gradual decrease of tensile properties would occur. However, no difficulty was encountered in removing the test slabs from the mold even at the end of the sixth day of storage. Storage under various humidity and

TABLE XII—EFFECT OF STORAGE OF THE COMPOUNDED STOCK ON THE TENSILE PROPERTIES OF LACTOPRENE BN-12.5 VULCANIZATES

	Time in Days				
	0	1	2	3	6
Tensile strength, p.s.i.....	1350	1190	1200	1210	1010
Elongation, %	640	600	630	570	690
Modulus at 300%, p.s.i.....	800	640	650	630	540
Shore A hardness (30 sec.).	48	51	46	49	48

Note: Copolymer prepared by American Monomer Corporation, Leominster, Mass. Recipe the same as F(III). 15 min. cure at 300°F.

temperature conditions and remilling the stock before placing it in the mold did not appear to show any significant difference in the tensile data. Furthermore, variations in the amine-sulfur ratio in the recipe or temperature of milling resulted in a similar decrease of tensile strength and modulus in the first 24 hours and these properties would then remain fairly constant for the next few days.

Another paper in preparation will describe the properties of the vulcanizates obtained from the copolymer of ethyl acrylate-acrylonitrile and another copolymer of butyl acrylate-acrylonitrile. The latter, prepared from a monomer mixture of 95% butyl acrylate and 5% acrylonitrile, results in vulcanizates with lower brittle points but greater swelling in lubricating oils than Lactoprene BN-12.5 vulcanizates.

Summary

The data presented in this paper show that vulcanizates of Lactoprene BN-12.5, a copolymer of butyl acrylate and acrylonitrile, have certain properties superior to the vulcanizates of Lactoprene EV which was developed several years ago at this Laboratory. The Lactoprene BN vulcanizates have substantially lower volume swelling in water and lower brittle points than the vulcanizates of Lactoprene EV. Furthermore, the vulcanizates of this new rubber have outstanding resistance to dry heat, satisfactory oil resistance and low compression set. Because of these properties, Lactoprene BN-12.5 should provide improved materials for gaskets, O-rings, oil seals and similar items used in mechanical equipment.

ACKNOWLEDGMENT

The authors wish to acknowledge the cooperation of the Government Laboratories at the University of Akron in the preparation of the Lactoprene BN-12.5 sample used in the major part of this study. We are also indebted to the American Monomer Corporation for a sample of the copolymer; to the General Electric Company for a sample of a silicone vulcanizate; to T. J. Dietz for his helpful suggestions in the early stages of this development; to H. C. Fromuth for his assistance in obtaining some of the data presented in the paper, and to J. Siciliano for obtaining many of the brittle points.

LITERATURE REFERENCES

(1) Mast, W. C., Rehberg, C. E., Dietz, T. J., and Fisher, C. H., *Ind. Eng. Chem.*, **36,** 1022 (1944).
(2) Mast, W. C., Smith, Lee T., and Fisher, C. H., *Ind. Eng. Chem.*, **36,** 1027 (1944).
(3) Mast, W. C., Dietz, T. J., and Fisher, C. H., *India Rubber World*, **113,** 223 (1945).
(4) Dietz, T. J., Mast, W. C., Dean, R. L., and Fisher, C. H., *Ind. Eng. Chem.*, **38,** 960 (1946).
(5) Mast, W. C., Dietz, T. J., Dean, R. L., and Fisher, C. H., *India Rubber World*, **116,** 355 (1947).
(6) Mast, W. C., and Fisher, C. H., *Ind. Eng. Chem.*, **40,** 107 (1948).
(7) Hansen, J. E., Palm, W. E., and Dietz, T. J., Bur. Agric. Ind. Chem., U. S. Dept. of Agric., AIC-205, September, 1948 (Eastern Regional Research Laboratory).
(8) Mast, W. C., and Fisher, C. H., Bur. Agric. Ind. Chem., U. S. Dept. of Agric., AIC-206, December, 1948 (Eastern Regional Research Laboratory).
(9) Dietz, T. J., and Hansen, J. E., Bur. Agric. Ind. Chem., U. S. Dept. of Agric., AIC-302, March, 1951 (Eastern Regional Research Laboratory); *Rubber Age*, **68,** 699 (1951).
(10) Filachione, E. M., Fitzpatrick, T. J., Rehberg, C. E., Woodward, C. F., Palm, W. E., and Hansen, J. E., *Rubber Age*, **72,** 631 (1953).

TABLE XI—BRITTLE POINTS[a] (°F.) FOR LACTOPRENE BN-12.5 VULCANIZATES AND COMMERCIAL RUBBERS FOR VARIOUS EXPOSURE CONDITIONS

Sample Designation	Air-Convection Oven Drying				Oil Aging					
		At 300°F.		At 350°F.	ASTM No. 1		ASTM No. 2		Commercial Automatic Transmission Fluid	ASTM No. 3
	Initial	1 day	3 days	28 days	1 day	3 days	3 days at 300°F.	28 days at 350°F.	3 days at 300°F.	28 days at 350°F.	3 days at 300°F.	at 300°F.
J(II)[b]	−11.0	—	−15.0	+ 5.0	—	− 9.5	−21.0	− 2.2	−18.5	− 2.0	−40.0	−27.5
F(III)	− 7.0	—	− 9.5	+10.5	—	− 2.0	− 9.5	−13.0	−13.0	−13.0	−29.0	−13.0
B(IV)	+ 5.0	—	+ 5.9	+17.5	+14.0	—	+ 8.5	+ 1.5	—	—	−20.0	− 4.0
K(IV)	+ 1.5	—	− 4.0	+21.0	+ 7.0	—	− 6.0	—	− 4.0	—	−16.5	−15.0
Hycar OR-25	−28.5	+ 7.0	+23.0	—	—	—	—	+10.5	—	+ 3.0	—	—
Hycar PA-21	+10.5	—	+12.0	—	—	—	—	+48.0	—	+46.5	—	—
Hycar OR-15	− 4.0	+36.0	—	—	—	—	—	+28.5	—	+23.0	—	—
Perbunan 26	−60.0	−35.0	+ 8.5	—	—	—	—	−27.5	—	−20.0	—	—

(a) ASTM method of test D746-44T, manually operated. (b) Symbol indicates the table and recipe for preparing the vulcanizates.

Fig. 1—Bales of top grade natural rubber arrive at the plant where they are guillotined for feeding into the mills as the first step in the manufacture of hard rubber bowling balls.

Manufacture of Bowling Balls at Stowe-Woodward

IN 1907, Robert J. Wilkie, the owner of a small hard rubber manufacturing plant in Lynn, Mass., succeeded, after long research and experimentation, in developing a satisfactory hard rubber bowling ball. Until that time, bowling balls had been made of lignum vitae, one of the hardest woods known. These wooden balls, however, were easily chipped and became out of round after a period of time. A few years after Mr. Wilkie developed the hard rubber bowling ball, he joined Stowe-Woodward, Inc., of Newton Upper Falls, Mass., where he was placed in charge of the manufacture and sale of the "Ebonite" ball. Mr. Wilkie remained with Stowe-Woodward until his death in 1943, and he lived to see his invention universally accepted.

The manufacture of a hard rubber bowling ball at Stowe-Woodward is composed of a series of processes which take approximately twelve days from start to finish. The accompanying photographs trace the steps taken in the manufacture of the ball after the bales of natural rubber have been received and guillotined for feeding into the mills. In order to give the ball its proper weight of sixteen pounds, the core of the ball has a high specific gravity. After the core has been made it is covered with a super tough resilient hard rubber shell.

When the finished ball is removed from the mold, it is first turned with a diamond tool, the diamond being the only material which will stand up under the machining operation in hard rubber. The ball is then put into a centerless grinder which brings the product down to its finished size. When the ball leaves the grinder it is a perfect sphere within 0.001 inch.

The ball also goes through a series of severe and accurate tests. Its hardness is controlled carefully to assure the proper degree of grip on the bowling alley and to produce a product of the proper resiliency. Every ball must meet exacting specifications of weight because after the grip has been drilled into the ball it must still be balanced in a six-way test to come within the American Bowling Congress' regulations.

Every ball must also pass a severe impact test which, in this case, consists of bouncing it several times from a height of six feet or more on a solid steel plate. If a ball can pass this test, the company believes, it can take whatever punishment will be meted out to it in regular play. In recent years the company has introduced several improvements in its hard rubber bowling balls, notably in the drilling of the grips. These constant improvements in design and manufacture combine to offer to the nation's 20,000,000 bowlers a product which Stowe-Woodward guarantees for five years.

Fig. 2—Rubber and chemicals, thoroughly blended, emerge from the mill in sheets, are aged, remixed and aged again, imparting, after heat treatment, hardness and resiliency to the ball.

Fig. 3—The sheets of compound are sliced into strips which are fed into a tubing machine. The sausage-like cylinders are then cut to length to form the core of the bowling ball.

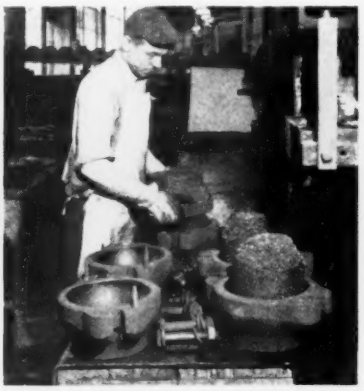


Fig. 4—Bolted in a heavy mold, the partly formed core, of high specific gravity to give the finished ball its full 16-pound weight, goes into a vulcanizer for curing under pressured steam.

Fig. 5—After leaving the vulcanizer, the core is put on a lathe where an operator turns it to exact size. This core gives the ball weight, toughness and the ability to withstand hard abuse.

Fig. 6—The core is then put in a new set of molds between shells of special tough rubber. Under heat and pressure applied by the press above, the two cells fuse, surrounding the core.

Fig. 7—Conveyed to a giant oven for final vulcanizing at high temperature, the bolted molds remain overnight for thorough heat penetration of the cover and the core of the ball.

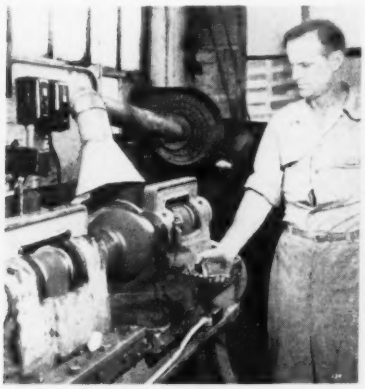


Fig. 8—After vulcanization, the ball goes to another lathe where the excess rubber is trimmed from the ball by a diamond, the only material durable enough for this operation.

Fig. 9—This photograph shows an employee impact testing a bowling ball. Each ball is bounced repeatedly on a heavy steel plate set in concrete to prove its durability.

Fig. 10—The ball is now floated in a mercury pool. It was made heavier on one side, and that side rotates to the bottom. The spots for finger holes are marked on the heavy side.

Fig. 11—Shown above is an inspector checking a ball with delicate micrometers. The finished ball must be a perfect sphere within 0.001-inch, or else it is rejected by the company.

Fig. 12—In this operation, finger and thumb holes are cut out, often to individual specification. After the sharp edges are sanded away, the ball receives a final buffing and polishing.

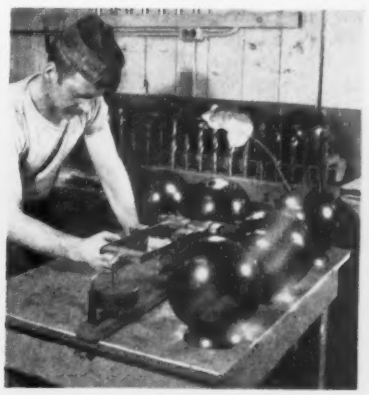


Fig. 13—To meet exacting A.B.C. specifications, each ball is balanced six ways on the "dodo" scale. The ball is now ready for packaging and for shipment to dealers throughout the country.

How to Get Best Results from Elevator Conveyor Belts

By A. F. MATHEIS

Assistant Vice-President, Thermoid Company, Trenton, N. J.

PROPERLY selected, installed and maintained, the elevator conveyor belt with metal buckets is one of the wheel-horses of bulk materials handling. A versatile, compact, easily-integrated connecting link, this type of conveyor offers engineers greatly increased flexibility in solving materials handling problems. Continuous in operation, the unit fits in with and maintains or improves the efficiency of continuous systems. It occupies little floor space and adapts easily to out-of-the-way places—against a wall, for example.

But to take fullest advantage of the versatility, space-saving and other benefits which these units can bestow, a few simple rules for selection, installation and maintenance must be observed. These will be discussed below.

Selection of the Belt

First-rate performance of the elevator conveyor belt hinges on proper allowance for such interdependent factors as material to be conveyed, height, bucket spacing, and belt speed.

Material to be conveyed will determine choice of elevator type (boot loading or continuous bucket), bucket shape, size and spacing, and kind of metal. For instance, a material that is light, soft and finely ground can be handled by large buckets, closely spaced, made of light-gauge, inexpensive metal. Material of these specifications will fill each bucket nearly to capacity. If the material is corrosive, a corrosion-resistant metal such as stainless steel should be used.

The centrifugal discharge or boot loading elevator (Figure 1) is best suited to free flowing materials although lumpy materials up to 3-inch diameter often are handled. The unit is usually vertical and the buckets are filled by "digging from the boot".

On the other hand, heavy, hard, lumpy materials are usually best handled by continuous bucket elevators (Figure 2) which are fed directly from a loading chute. To facilitate loading and discharge these elevators usually are inclined, the belt being supported on the up-run by flat carrier pulleys. In discharge, the bottom and sides of the bucket ahead form an auxiliary discharge chute for material from the bucket above. The buckets must be large and of wear-resistant metal. Height the material is to be raised should not, in general, exceed 75 to 80 feet because of the danger of swaying.

Bucket projection should be watched and kept as small as possible consistent with good capacity. The farther the bucket extends out from the belt, the greater the stress on the bolts holding the bucket to the belt and the greater the possibility of the bolts pulling out. Thus, the extent of bucket projection also affects belt thickness i.e., the greater the leverage on the bucket bolt heads, the more plies are required to keep the bolts from pulling through (see Table I).

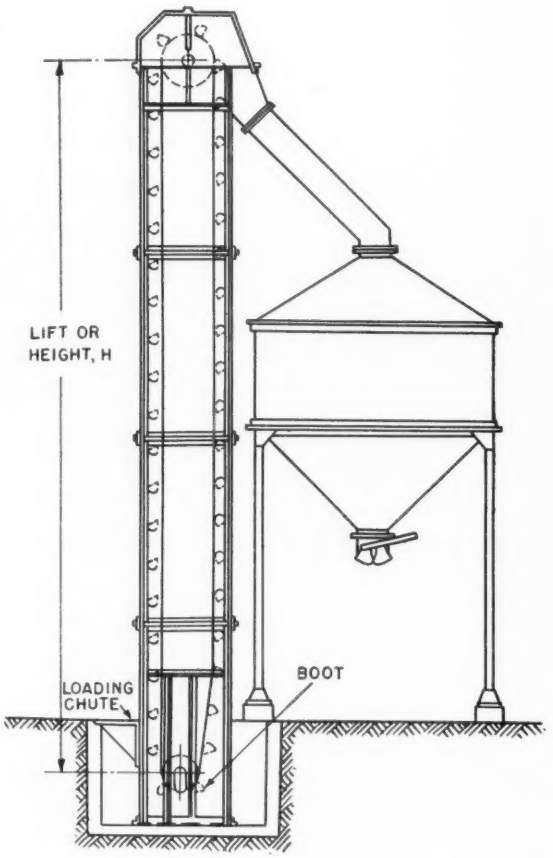


FIG. 1—Centrifugal discharge or spaced bucket elevator.

As for bucket spacing, the closer the buckets are placed to each other, the greater the capacity of the belt for equal speeds. However, also increased are the load on the belt and the number of bolt holes which weaken the belt. If buckets are set too close together, a belt of such thickness may be required to support the load that either excessively large diameter pulleys will in turn be required or the belt will be short-lived from over-flexing over a normal-sized pulley (see Table II).

The problem of loading and discharging the buckets may be troublesome with certain types of materials. Discharge pattern may often be improved by a faster mov-

TABLE I—MINIMUM PLIES FOR VARIOUS BUCKET PROJECTIONS

Materials Caried, Type of Service, Maximum Lump Size	Bucket Projection in Inches 3″	4″	5″	6″	7″	8″	10″	Belt Fabric
For Centrifugal Discharge or Spaced Bucket Elevators Minimum Belt Plies								
Light, Free-Flowing Materials								
Low Speed Grain Elevators	4	4	5	5	6	6	—	28 Oz. or 32 Oz.
High Speed Grain Elevators	—	—	—	5	6	6	—	32 Oz.
Materials 100 lbs. per cu. ft. or under Coal, Earth, Ashes, Cinders, Dry Sand, Crushed Stone, etc.								
1″ and under	4	4	5	6	6	7	8	32 Oz. or 35 Oz.
1¼″ and under, or 1″ uniform	—	5	6	6	6	7	8	32 Oz. or 35 Oz.
2″ and under, or 1½″ uniform	—	*	*	7	7	7	8	32 Oz. or 35 Oz.
2¼″ and under, or 1½″ uniform	—	*	*	*	8	8	9	32 Oz. or 35 Oz.
3″ and under, or 2″ uniform	—	*	*	*	*	9	10	32 Oz. or 35 Oz.
Materials over 100 lbs. per cu. ft. mostly ores, 1″ and under	—	5	6	7	7	8	9	35 Oz.
1½″ and under, or 1″ uniform	—	6	7	7	7	8	9	35 Oz.
2″ and under, or 1½″ uniform	—	*	*	8	8	9	10	35 Oz.
2½″ and under, or 1½″ uniform	—	*	*	*	9	10	11	35 Oz.

For Continuous Bucket Elevators

	Bucket Projection in Inches 5″	6″	7″	8″	10″	12″	16″	
	Minimum Belt Plies							
Materials 100 lbs. cu. ft. or under	6	7	7	8	9	10	12	35 Oz.
Materials over 100 lbs. per cu. ft.	7	8	8	9	10	11	12	35 Oz.

Note: The leverage on the bucket bolt heads, due to the digging action and the load, increases with greater bucket projection, so that more plies are required to keep the bolts from pulling through. (*) Lump size too large for the bucket mouth.

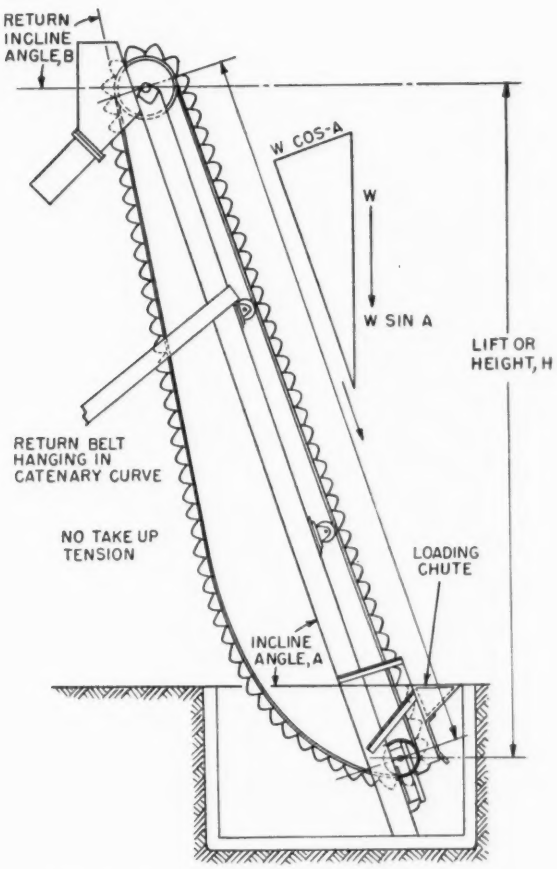


FIG. 2—Inclined continuous bucket elevator.

ing belt that will throw the material clear of the bucket. Belt speed also affects belt capacity and thickness. As the speed increases, so does the number of belt plies required to resist the tension applied by the driving pulley. Largest factor to be considered in determining belt speed is usually the feed rate of other equipment, such as the belt conveyor which delivers the material to the pit.

Installation Procedures

Method of installation is the second crucial step; it should supplement, but it could cancel out, the good results gained by optimum blending of selection factors. During installation, attention must be given to proper splicing, alignment, loading, tension, safety devices and pulley lagging.

In general, the sequence of installation steps is as follows: Belting should be mounted on a strong wooden or metal stand and metal bar at point of installation. To punch bolt holes, draw a belt on to a temporary table, bucket side up. Mark bucket spacings with steel square

TABLE II—MAXIMUM PLIES FOR STANDARD PULLEY DIAMETERS

Head Pulley Diameter (Inches)	Maximum Plies	Minimum Foot Pulley Diameter (approx.) (Inches)
20	5	15
24	6	18
28	7	21
30	8	22
36	9	26
42	10	30
48	12	36
54	13	40
60	15	42

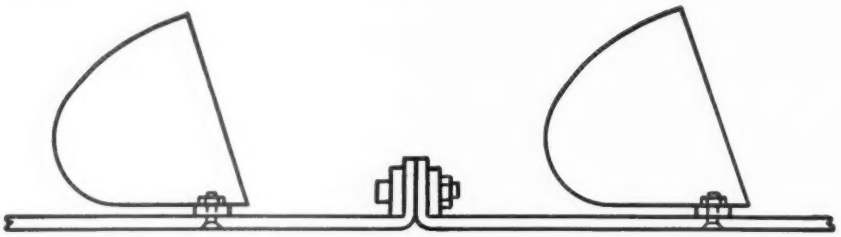


FIG. 3—Clamp joint.

in pencil. Make a template of bolt holes or place punched bucket over spacing lines and mark position of bolt holes. Punch and cement holes to protect the belt carcass thus exposed. They should provide a snug fit for the bolts. Push bolts through belt and place on each a leather washer. Place buckets over bolts and tighten nuts with round side next to buckets. The use of lock washers is recommended. Norway flat head bolts meet most requirements. Use ¾-inch bolts on 4-ply belts, 1-inch bolts for 5 and 6 ply and 1¼-inch for 4 and 8 ply.

If an old belt is being replaced, the old belt may be cut near the foot of the elevator and fastened to the end of the new belt so it may be drawn into place as fast as the buckets are attached.

Splicing Details

Clamp Joint: The type of belt splice depends on the thickness of the belt and the severity of service. For belts of 5-ply thickness, or under, the bolted clamp joint may be used. Belt ends must be bent outward at right angles to form a ridge which is then bolted between a bar clamp. This joint is strong and resistant to shock and the bend is well tolerated by thin belt (see Figure 3).

Lap Joint: A lap joint splice is commonly used on grain and continuous bucket elevators. Belts must be lapped so pulleys "fall off" shoulder during running. In other words, the end of the lap in contact with the pulley should be the last part of the joint to pass over the pulley. The lap extends a distance of from 3 to 5 buckets and is secured by the same bolts that hold the buckets. Bolts at end of lap must be tight and belt trimmed close to the bolts (see Figure 4). This splice is not suitable for belts over 7 plies thick because it is too stiff to pass tightly over the pulleys and shear-action in the lap may be severe enough to work bolts loose.

Butt-Strap Joint: The butt-strap joint may be used on belts of 8 or more plies. After ends are square and butted tightly against each other, a piece of belting is bolted over the ends, covering equal distances on each side of the break. For spaced buckets this piece should be twice the belt width. With continuous buckets the splice extends under two buckets on each side of the butt (see Figure 5). A double row of bolts is required at the butted ends, and may necessitate omission of one bucket. A single row of bolts is placed on each end of the strap. Place one bolt for every inch of belt width, ½-inch bolts for belts under 10 plies, ⅝-inch bolts for over 10 ply.

Plate Joint: The plate joint made by bolting plates across the butted ends of the belts may be used on all belt thicknesses. It is better than the lap and butt strap splice on stiff thick belts because there is practically no shear action.

Alignment: Alignment is another factor that should be closely watched during installation and thereafter. A crooked-running belt strains pulleys and shafting, wastes power, wears bearings and subjects the belt itself to the danger of being damaged if a bucket should foul on the housing. The feed chute must fill the buckets evenly so that excess material does not pile up on one side of the boot.

Loading: Uniform loading, through uniform delivery to the boot, is another very valuable aid to steady, consistent operation. The belt must be protected against the effect of material spilled on up-run or at the head pulley. Such material, in falling down the leg, lodges between the belt and the foot pulley. Where small size material is to be conveyed, flat-type, paddle wheel pulleys are recommended for use as foot pulleys, since they will allow the spilled material to pass off harmlessly. Larger lumps of material, however, require that a protector be placed above the foot pulley. An inverted board or sheet metal V-fitted with flexible edges of old belting, touching the inner return side of the belt lightly, will

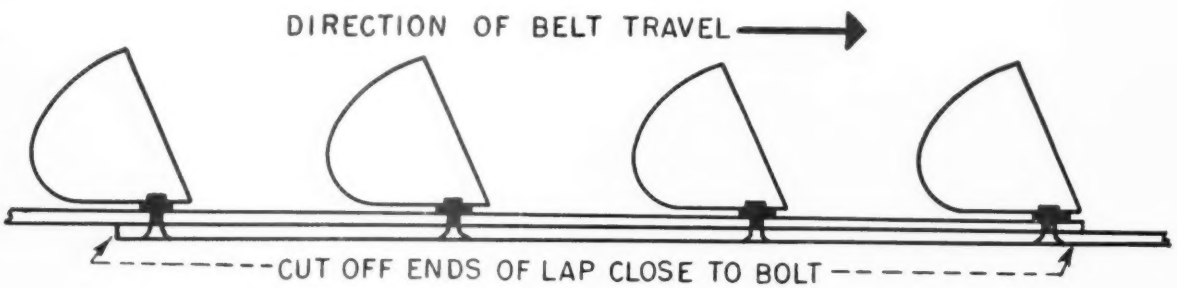


FIG. 4—Lap joint.

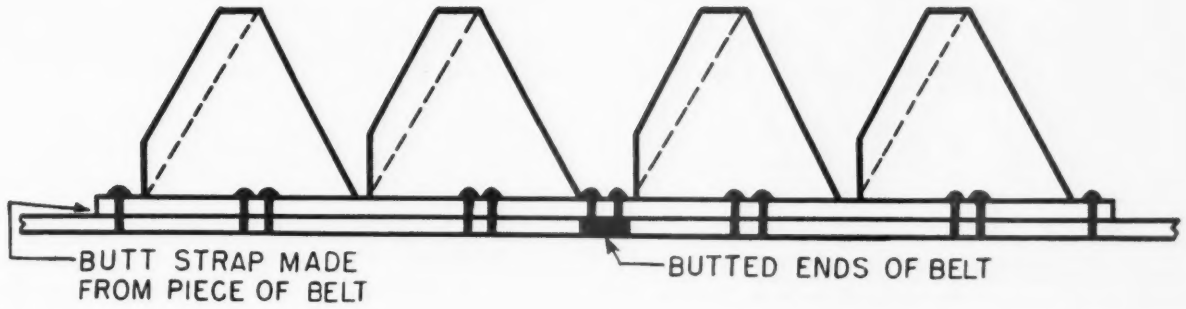


FIG. 5—Butt-strap joint.

divert larger lumps effectively. Such a protector must be checked and adjusted daily.

Tension: Proper tension—enough to overcome slippage but no more—must be maintained whenever the belt is in operation. On inclined elevators, too much sag may cause the buckets to snag in the housing. Take-up provision should be present on all installations and the same tension must be maintained on both edges of the belt.

Safety Devices: As for safety devices, when a choke occurs the head pulley must stop as soon as the belt slows down, otherwise the belt may be damaged or burned. Besides a control to assure this, two others should be installed—one to stop feeding when the bins are full and one to stop the conveyor from delivering to the boot as soon as the elevator motor is stopped. A backstop device to keep the elevator from running backwards under the weight of a load after the power has been shut off may be installed also. This may be done by placing on the end of the head shaft a ratchet wheel which engages a pawl fulcrumed on the beam supporting the head shaft bearing.

Pulley Lagging: Pulley lagging is another useful device on elevator head pulleys since it prevents wear on bucket bolts, particularly when the pulley side of the belt cover is not thick enough to allow the bolt heads to sink in. Lagging also may be used to increase the coefficient of friction between the belt and the pulley to obtain required tension and prevent slippage under the load. Two or three ply rubber-covered belting is most frequently used (see Figure 6).

Maintenance and Repairs

Regular Inspection: Since operating conditions are often more severe than anticipated and accidental damage occurs more often than many users realize, regular attention is more than justified to guard elevator installations against unnecessary wear and preventable damage. Inspection should be made at least once a week for loose bucket bolts, worn washers, faulty splices, buckets, belts and pulleys. Housings and foot pulley protectors should be constantly adjusted and accumulations dislodged. Anything which might snag the buckets while the belt is in operation must be detected immediately.

Repairing Damage: Any belt damage, no matter how slight, should be repaired immediately. Belt fabric in the carcass exposed to weather or damp atmosphere will absorb moisture and may even become soaked if the protective cover becomes damaged. In warm weather, this condition leads to mildew and rot; in winter, ice crystals form and gnaw at the fabric from within as the belt flexes. Hence, immediate repairs not only prevent the spread of damage, but also keep out the water which is the natural enemy of the carcass of conveyor belts.

Repair Kit: An adequate repair kit includes: sharp cobbler's knives and a stone to keep them sharp, a supply of emery cloth, rubber cement, inner tube patching rubber, rip-plates, standard belt fasteners and accessories, rags, and cleaning fluid. As each belt is installed, remnants should be kept for they will prove useful in subsequent repairs.

Fasteners and rip-plates lend themselves to quick repairs when a deep cut or tear occurs. For smaller breaks in the cover, a piece of remnant cover-stock may be cemented over the break to keep out moisture and dirt until more permanent repairs can be made.

To mend long and deep cuts which go through to the fabric, open the cut, clean out all the dirt, and cement the cut closed, allowing the cement to dry thoroughly before the belt is restored to service.

Where bits of torn cover leave exposed parts with only slight damage to the fabric, remove the loose ears of cover-stock by carefully cutting a curved and bevelled edge around the spot. Then sand edges, apply cement, allow to dry, apply tire patching rubber and finally skive the patch flush with belt cover.

Gouges which have penetrated the belt, or longitudinal rips, must be cleaned, sanded, cemented, and reinforced with rip-plates at three-inch intervals.

Transverse rips require similar treatment with standard belt-fasteners instead of rip-plates. Use rip-plates on longitudinal rips only, standard fasteners on transverse rips only.

When holes do not permit use of rip-plates and fasteners, cut out the hole into the smallest possible rectangle, with its sides parallel to and at right angles to the belt edges. Then, from belting remnants, cut an exact fit for the hole, cementing all edges thoroughly.

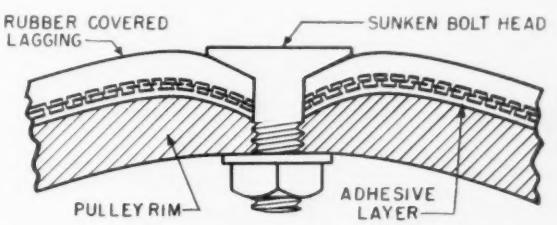


FIG. 6—Pulley lagging.

and insert, securing it with belt fasteners all around the patch.

Users of large quantities of conveyor belting, as in coal and ore mines, quarries and gravel plants, will probably find it profitable to set up an extensive belt maintenance and repair organization, including a belt boss and crew, repair shop with long belt drying racks, tables, and portable and stationary vulcanizers.

Vulcanized Patches: Vulcanized patches have greater flexibility, strength and permanence than those described above. In preparing a vulcanized patch, work down into the damaged belt as far as necessary by removing progressively smaller blocks of fabric with each successive ply to depth required by the injury. When the patch goes through the belt, work in through bottom ply, just as from the top ply, to meet work from top inwards. Clean, roughen and cement the cavity, fit in blocks of new fabric and, finally, apply the uncured cover. Skive edges of patch flush and vulcanize. Such patches cannot be made successfully unless the belt is dry, because the presence of moisture will permit development of internal steam blisters.

Only users of large amounts of conveyor belting will find it necessary to vulcanize their own belt patches. Small users can arrange with belt manufacturers, local firms or neighboring large users for vulcanizing service when required.

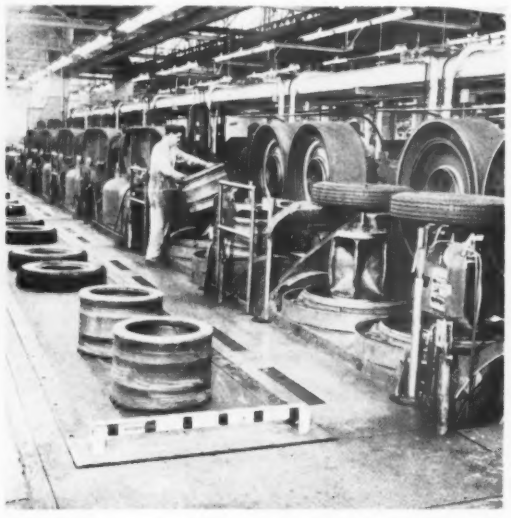
Unique Conveyor Belt System Employed in Goodrich Tire Plant

LARGE truck tires on their way to and from the vulcanizing presses at the Miami, Okla., plant of the B. F. Goodrich Tire & Equipment Division, now make the trip on their own unique moving rubber sidewalk. Conveyor belts installed flush with the ground floor level haul "green" tires to the vulcanizing press and carry away vulcanized tires to the final inspection point. This installation is the first of its type in any Goodrich tire manufacturing plant.

The conveyor belt installation is part of the major expansion recently completed at the Miami plant. The over-all installation includes four conveyor belts, each 48-inches wide, which are located in front of parallel lines of presses. These four belts empty their vulcanized tires onto a fifth belt, which carries the tires to an inspection point where the vents on the exterior of the tires are trimmed. Over-all length of the belt installation is 1,148 feet.

In operation, the system is simplicity itself. Tires are taken from a stock preparation point and placed on the belt in predetermined positions. When the belt is set in motion by the operator, it moves forward to a point where "green" tires rest in front of each press. The belt is not again set in motion until all the tires have been loaded into the presses, vulcanized, and placed on the belt. The vulcanized tires are then carried by the belt to the fifth belt, which carries them to the final inspection point.

This layout provides safer working conditions, eliminates a good deal of the handling formerly necessary in moving the heavy truck tires, and subsequently helps increase production. Belts are installed at a level with respect to vulcanizing presses so as to minimize handling effort of the tires. Goodrich reports the Miami installation has proven the value of this type of "moving sidewalk" conveyor application.



This line of vulcanizing presses at the Goodrich plant in Miami, Okla., is fed by a moving rubber sidewalk installed flush with the ground floor level. An operator is shown here placing an uncured tire in one of the presses while vulcanized tires are shown to the right.

The moving rubber sidewalk is shown here carrying vulcanized tires from the vulcanizing presses to a final inspection point at the Miami plant. The company states that this is the first installation of its type in any of its tire manufacturing plants.

Division of Rubber Chemistry, A.C.S., Meets in New York on September 15-17, 1954

THE 66th Meeting of the Division of Rubber Chemistry of the American Chemical Society will be held at the Hotel Commodore in New York, N. Y., on Wednesday, Thursday and Friday, September 15, 16 and 17. The meeting will feature the presentation of 34 technical papers, and will include a luncheon-meeting of the 25 Year Club, a business meeting, and the usual divisional banquet. Another feature of the meeting will be the presentation of the Charles Goodyear Lecture by Dr. G. Stafford Whitby, director of rubber research at the University of Akron. Dr. Whitby will speak on "Reflections on Rubber Research."

The technical program has been divided into five sessions, namely, Wednesday afternoon, Thursday morning and afternoon and Friday morning and afternoon. J. C. Walton (Boston Woven Hose), divisional chairman, will preside over the Wednesday afternoon and Thursday morning sessions. C. R. Haynes (Binney & Smith-retired) will preside on Thursday afternoon, while John M. Ball (Midwest Rubber Reclaiming), divisional vice-chairman, will preside on Friday morning. Joseph Breckley (Titanium Pigments) will preside at the session on Friday afternoon.

It is to be noted that the program on Thursday afternoon, September 16, consists almost entirely of papers on new synthetic rubbers. Other features of the meeting on Thursday will be a suppliers' cooperative cocktail party and the divisional banquet which will be held in the evening at the Hotel Commodore. The Charles Goodyear Medal Award ceremony will be a feature of the banquet. There will also be a program of entertainment. An interesting and extensive program is being provided for the ladies under the direction of the Hazel Bishop firm.

Mr. Breckley is acting as chairman of the Local Arrangements Committee with G. N. Vacca (Bell Telephone Laboratories) as vice-chairman. Chairmen of other activities are as follows: *Banquet*, A. H. Eufer (R. T. Vanderbilt); *Finance*, A. S. Lang, (H. V. Hardman); *Information*, J. Roy Keating (Binney & Smith); *Program and Meeting Rooms*, Dr. Carl C. Sweitzer (Columbian Carbon), and *Publicity*, S. M. Martin, Jr. (Thiokol). The 25-Year Club Luncheon will be under the direction of B. R. Silver (N. J. Zinc), while the Suppliers' Cocktail Party will be under the direction of E. B. Curtis (R. T. Vanderbilt) and J. M. Hamilton (Binney & Smith).

Abstracts of the 34 papers scheduled for presentation, together with their authors and their company connections, follow:

Program of the
DIVISION OF RUBBER CHEMISTRY
AMERICAN CHEMICAL SOCIETY
Hotel Commodore, New York, N. Y.
September 15-17, 1954

Wednesday Morning—September 15

9:00 A.M.—Registration.
11:00 A.M.—25-Year Club Luncheon.

Wednesday Afternoon—September 15

2:00 P.M.—Introductory Remarks by J. C. Walton (Boston Woven Hose), Division Chairman.
2:10 P.M.—Technical Papers.

Thursday Morning—September 16

9:00 A.M.—Technical Papers.
11:15 A.M.—Charles Goodyear Lecture by Dr. G. Stafford Whitby (Akron University).

Thursday Afternoon—September 16

2:00 P.M.—Technical Papers.

Thursday Evening—September 16

5:00 P.M.—Suppliers' Cooperative Cocktail Party, Hotel Commodore.
7:00 P.M.—Divisional Banquet.

Friday Morning—September 17

9:00 A.M.—Technical Papers.

Friday Afternoon—September 17

2:00 P.M.—Technical Papers.

ABSTRACTS OF PAPERS

Wednesday Afternoon—September 15

J. C. Walton, Presiding

2:00 P.M.—1—Introductory Remarks

2:10 P.M.—2—Studies on the Determination of Relative Road Wear Ratings of Tire Tread Stocks. *F. H. Amon and E. M. Dannenberg (Godfrey L. Cabot, Inc., Boston, Mass.).*

During the past decade, the production of carbon black by the channel process based on natural gas as the raw material has largely been replaced by furnace processes utilizing aromatic oil raw materials. This major change has resulted in the introduction of many new qualities of oil furnace blacks covering a wide range in particle size and reinforcing properties. In the manufacture of tires these new blacks have found applications in all the important tire components. The marked improvement in the road wearing properties of tire treads in recent years has been due in part to the availability of the more reinforcing grades of oil furnace blacks. In the development of these new carbon blacks and for the careful control of their quality levels the results of controlled road testing programs have played a major role.

Cabot test cars have been operated on a continuous basis since 1948 and today almost 2,000,000 vehicle miles have been completed. Although the primary purpose has been evaluation and control of carbon blacks of many types, these road tests have also resulted in other information of general interest on tire testing variables and techniques. The application of variance analysis to both whole tire and two-way tire test procedures is demonstrated. For the purpose of establishing the relative wear ratings of tread stocks, it has been found that greater precision is possible with "half and half" or two-way treads than with whole treads. From the standard deviations of the relative ratings observed using

both two-way and whole tire treads, it appears that two-way construction is almost four times more efficient than whole tire construction. A comparison of relative tire wear ratings by both depth loss and weight loss methods is presented.

Additional information on the influence of speed, atmospheric temperature, type of road, and wheel positions on road wear and the relative road wear performance of various types of carbon blacks in both natural and synthetic rubbers is presented and discussed.

2:35 P.M.—3—Relaxed Compression Set—A Definitive Property of Vulcanizates. *L. R. Sperberg (Sid Richardson Carbon Co., Odessa, Texas).*

One of the paramount problems confronting the rubber technologist today is the lack of a suitable means for measuring the fundamental property of state of cure of soft rubber vulcanizates. Many criteria, such as tensile corner, modulus inflection point, free sulfur, etc., are used but experience has shown they are better measures of rate than of state of cure. With this problem the author soon concluded that before one could measure, one must of necessity define vulcanization. Many definitions exist but the simplest is one which defines vulcanization by reference to the most noticeable change which occurs during vulcanization;—any treatment which decreases plasticity without lowering elasticity. With vulcanization thus defined the author reasoned that measurements of set acquiring characteristics of vulcanizates should quantitatively indicate state of cure. With this background and over a series of years the relaxed compression set test evolved. In its present form it has been used by the author over seven years.

The relaxed compression set test gives results that are independent of degree of compression as long as the structural strength of test specimens are not exceeded during compression. It works for all types of vulcanizates—gum, pigmented, natural, synthetic, sulfur, non-sulfur, etc. The results are expressed numerically between 100 and zero. The relaxed compression set test can be used to study the mechanism of vulcanization; at normal operating temperatures a measure of intermolecular bonds is obtained, while at subnormal temperatures a measure of intramolecular bonding can be estimated.

When vulcanizates are compared at equal compression set values, individual influences of any of the compounding ingredients can be readily determined. Many physical properties vary linearly with change in compression set. Temperature coefficients of vulcanization calculated from relaxed compression set data are in agreement with published values. The relaxed compression set test reports a definitive property of vulcanizates and, to one familiar with the test, a definite value of relaxed compression set is highly indicative of a specific state of cure.

3:00 P.M.—4—Fatigue of Rubber with Two-Way Stretching. *S. D. Gehman and R. P. Clifford (Goodyear Tire & Rubber Co., Akron 16, Ohio).*

Flexing failure of rubber in service is generally due to repeated complex strains. Laboratory flex testing, on the other hand, has usually been based on a relatively simple extension and retraction cycle. A machine was constructed and used to study the fatigue of rubber subjected to biaxial strains of controlled amplitude and phase relationships. Alternate biaxial straining (strains 180° out of phase) was the most severe phase condition and reduced the flex life of a cold rubber tread compound by a factor of 11 in comparison with one-way stretching. In-phase biaxial straining reduced the flex life by a factor of 1.7.

The severity of alternate biaxial straining was attributed to the stretching which occurred transverse to induced fiber structure and to the persistence of fiber structure at the point of zero strain. Alternate biaxial straining was accompanied by high hysteresis losses as shown by the temperature rise of the surface. This rise was sufficient to affect the flex life so that for this type of deformation there was a definite dependence of flex life on hysteresis. Alternate biaxial straining gave flex life vs. cure curves with a plateau or broad maximum for a range of cures. It provided a means for selecting an optimum cure range for this type of flex life for each polymer. In this way, polymers could be compared at their optimum cures for flex life.

3:25 P.M.—5—"Smearing" of Vulcanized Rubber. *S. D. Gehman, C. S. Wilkinson, Jr., and R. D. Daniels (Goodyear Tire & Rubber Co., Akron 16, Ohio).*

The surface heating which occurs at the interface of rubber sliding under load may be part of the mechanism of abrasion, especially under severe conditions. Removal of rubber by thermal degradation and a smearing process occurs if the rubber surface attains sufficiently high localized temperatures. A procedure, using a melting point bar, was developed for measuring the temperature at which smearing occurred for rubber vulcanizates. Smear points reproducible to about ± 2°F. were measured. The effect of compounding variables on the smear point was investigated. The most important compounding variable affecting the smear point of natural rubber was the accelerator system. Smear points for conventional types of rubber tread compounds were in the neighborhood of 400°F. The highest smear points, about 470°F., were obtained with Tuads acceleration. GR-S tread compounds had smear points greater than 500°F. The relatively high smear point of GR-S may be an important factor in explaining its superiority in road wear under severe service conditions. Laboratory abrasion experiments were performed to illustrate the effect of smearing on the relative abrasion loss of GR-S and natural rubber tread compounds.

3:50 P.M.—6—Milling Procedure: Its Effect on Physical Properties. *B. J. A. Martin and D. Parkinson (Research Centre, Dunlop Rubber Co., Ltd., Birmingham, England).*

From general theoretical considerations it is possible to regard the milling of natural rubber, which includes mastication, mixing and pre-molding processes, as producing two effects which may be opposed so far as the resulting physical properties are concerned. Thus, for example, molecular weight can be reduced while carbon-rubber or other reinforcing structure is formed. Or, again the formation of one kind of carbon-rubber structure may be accompanied by the breakdown of another. The direction and magnitude of the resultant effect on physical properties will depend on the milling conditions which are deliberately or accidentally imposed.

Using a small production size Banbury mixer an experimental study has been made of the effect on properties of some of the variations in milling which are encountered in practice. The variables include time and temperature of mastication and mixing, carbon black concentration in the masterbatch, variation in the order of incorporation of different compounding ingredients, and maturing. In addition, experiments have been made under conditions designed to limit the degree of oxidative breakdown during mixing.

The present experiments have been designed with a definite objective; what degree of control is required over mixing to maintain quality at a uniform level? A general conclusion cannot be reached on this point yet but the results show that a number of practically important properties are dependent on variations in milling procedure. For example, the level of tear resistance developed depends on mastication and mixing temperature as well as time, and on the concentration of black in the masterbatch. Fatigue resistance is affected by mastication time, and the temperature developed during flexing of the vulcanizate shows dependence on both time and temperature of mastication.

Also, electrical conductivity is strongly dependent on time and temperature of mixing as well as masterbatch black concentration. Properties can be affected also by the stage of the mixing cycle at which compounding materials are added. Thus, with high mixing temperatures early addition of zinc oxide increases appreciably the scorchiness of the stock.

4:20 P.M.—7—Correlation of Room Temperature Shelf Aging with Accelerated Aging. *R. A. Youmans and G. C. Maassen (R. T. Vanderbilt Co., New York, N. Y.).*

Natural rubber stocks were shelf aged for twenty-two years at room temperature and tested for physical properties at inter-

vals during that period. Similar stocks were aged in individual test tubes at 70°C., in the oxygen bomb at 70°C. and 300 lbs. psi., and in the air bomb at 127°C. and 80 psi. The results of these tests show that none of the accelerated test methods deteriorate all physical properties at the same rate. They may be used to predict tensile and elongation decay over a long period of shelf life but fall short in predicting modulus changes over the same period. Of the three types of accelerated aging methods used, the 70°C. test-tube method simulates natural aging changes most closely.

4:40 P.M.—8—The History of the Rubber Latex Industry. *Ernst A. Hauser (Massachusetts Institute of Technology, Cambridge, Mass.).*

The first patent for impregnating fabrics with latex was issued to Thomas Hancock in 1830. In 1850 Adriani reported that the dry rubber content of latex varied with the place on the tree from which it was obtained. Fourcroy had already pointed out in 1791 that latex could be preserved by the addition of alkali, but it was not until 1853 that a patent for the preservation of latex with ammonia was granted to Johnson. In 1855 Newton obtained a patent for the use of certain fillers with latex to act as binders for colors. The first patents covering the manufacture of molded articles directly from Hevea latex were issued to Hancock and Silver in 1864.

The first book devoted to rubber latex and its direct utilization in industry was written by Dr. Lucien Morisse, published in French in 1908. The first really scientific contributions on rubber latex were made by E. A. Hauser after his return from the Malay Peninsula in 1924 and again in 1927. He also wrote a monograph about latex based on colloid-chemical studies. This book was published in Germany in 1927 and, after translation by W. J. Kelly, in the United States in 1930. In 1928 his Gow Lectures on the colloid chemistry of the rubber industry were published and in the following year Paul Stamberger gave another series of lectures in London which appeared in print in 1929. These contributions must be classified as the actual foundation of the rubber latex industry. Since then several books have been published relating to the use of rubber latex in industry. Reference will be made to the contributions of Royce J. Noble, H. P. Stevens, P. H. Schidrowitz, A. Block and G. Genin, C. F. Flint, J. le Bras, and several others.

Thursday Morning—September 16

J. C. Walton, Presiding

9:00 A.M.—9—"Kel-F" Elastomer: A New Fluorocarbon Rubber. *M. E. Conroy, L. E. Robb, D. R. Wolf and F. J. Honn (M. W. Kellogg Co., Jersey City, N. J.).*

This new elastomer, a copolymer of chlorotrifluoroethylene containing more than 50% fluorine, is being made in experimental quantities by M. W. Kellogg for preliminary evaluation. A large pilot plant, scheduled for completion early in 1955, will provide material for more extensive field tests. "Kel-F" elastomer is available as a white spongy crumb (specific gravity = 1.85) or as a water dispersion. Because of its completely saturated chain structure "Kel-F" elastomer cannot be vulcanized by ordinary methods. However, polyisocyanates, polyamines, and organic peroxides in conjunction with basic metal oxides will cross-link the gum to form strong, elastic unfilled vulcanizates with tensile strengths up to 2500 psi. and elongations of 400-600%. Certain silicas provide additional reinforcement and tensile strengths up to 3800 psi. "Kel-F" elastomer is outstanding for its resistance to heat, solvents, chemicals, ozone, weathering. It is especially noteworthy for its resistance to fuming nitric acid and other oxidants. This paper will describe a number of recipes for vulcanizing "Kel-F" elastomer with emphasis on the physical and chemical properties of several peroxide cured stocks.

9:25 A.M.—10—Compounding Studies of Copolymers of Chlorotrifluoroethylene. *C. B. Griffis and J. C. Montermoso (Quartermaster Research and Development Center, U. S. Army, Natick, Mass.).*

A new type of fluorocarbon rubbers developed by the M. W. Kellogg Company in cooperation with the Office of the Quartermaster General, U. S. Army, has been made in sufficient quantity for compounding studies. The rubber reported here is a copolymer of chlorotrifluoroethylene. As this material exhibits rubbery rather than plastic properties, vulcanization is necessary to obtain useful products. Having no unsaturation along the polymer chain, it is not readily vulcanized by normal rubber curatives. This rubber has been successfully vulcanized with benzoyl peroxide, polyamines, diisocyanates, diisothiocyanates and diisocyanate-amines. Reinforcement filler studies established a silicone treated silica pigment as an unusual reinforcement filler. A softener study indicates that a wide variety of materials could be added to this fluorocarbon rubber to improve processing. The compounded vulcanizates have outstanding chemical resistance to strong oxidizing acids and petroleum-base fuels. The vulcanizates have excellent aging and weathering characteristics, flame resistance, and thermal stability.

9:45 A.M.—11—"Kel-F" Elastomer Fabrication and Applications. *L. E. Robb, D. R. Wolf, M. E. Conroy and F. J. Honn (M. W. Kellogg Company, Jersey City, N. J.).*

The fabrication of rubber goods from compounded "Kel-F" elastomer can be carried out with standard rubber equipment. The compression molding of mechanical goods such as O-rings and diaphragms is discussed. Little difficulty is experienced in the incorporation of reinforcing fabrics in molded goods. The extrusion of compounded stocks as performed on standard rubber extruders is discussed. Items fabricated by extrusion must generally be cured under slight pressure to preclude "blowing" of the peroxide curing agents. The calendering of "Kel-F" elastomer to produce thin, tough sheet stock is discussed. The solubility of "Kel-F" elastomer in ketones and esters is described. This solubility makes the rubber ideal for the formulation of chemical and heat resistant coatings and coated fabrics. The results of performance tests on several items fabricated from "Kel-F" elastomer are presented.

10:10 A.M.—12—Fluorocarbon Rubber Research. *F. J. Honn, J. M. Hoyt and A. N. Bolstad (M. W. Kellogg Co., Jersey City, N. J.), and C. B. Griffis and J. C. Montermoso (Quartermaster Research and Development Center, U. S. Army, Natick, Mass.).*

To promote the development of a rubber which is both oil-resistant and flexible at low temperatures, the Quartermaster Corps has sponsored an "Arctic Rubber" program at M. W. Kellogg since 1950 on the synthesis of fluorocarbon elastomers. Fluorocarbons were selected for study because the two best known fluorine polymers, "Kel-F" and Teflon, are chemically resistant to a high degree and serviceable over a wide range of sub- and super-normal temperatures. Data are presented here on a few of the many elastomers prepared to date from a variety of fluorinated monomers, many of which are newly synthesized.

10:35 A.M.—13—Poly-FBA: A Fluorine-Containing Polyacrylic Rubber. *P. J. Stedry and J. F. Abere (Central Research Department, Minnesota Mining & Manufacturing Co., St. Paul, Minn.).*

Solvent-resistant and heat-stable polyacrylic rubbers with fluorinated side-chains were developed by Minnesota Mining & Mfg. Co. under a contract with Wright Air Development Center, U. S. Air Force. The homopolymer of 1,1-dihydroperfluorobutyl acrylate, better known as Poly-FBA, is the first of these to reach pilot plant production. The monomer is derived from perfluorobutyric and acrylic acids and polymerizes readily in a simple emulsion recipe to form a stable latex. Dry Poly-FBA can be processed on conventional rubber equipment and formed into

molded or extruded shapes. Vulcanization is best accomplished with polyfunctional amines and the compounds can be reinforced with carbon blacks or inorganic pigments. Basic compounding technology will be presented.

Typical Poly-FBA vulcanizates have tensile strengths ranging from 1200 to 1500 psi. and compression sets of 20 to 25%. Modulus, ultimate elongation, and hardness can be readily adjusted. The compounds exhibit very low swelling in aliphatic and aromatic hydrocarbons, alcohols, chlorinated solvents, water, and acids. They are also suitable for extensive service in oils, synthetic lubricants, hydraulic fluids, and similar high boiling liquids at temperatures up to 400°F. In addition, Poly-FBA is inert to ozone and resistant to fuming nitric acid. Its principal shortcoming lies in limited low temperature flexibility.

This combination of properties, hitherto unknown in an elastomeric material, indicates uses for Poly-FBA as a specialty rubber under conditions of severe heat and oil exposure. First applications are expected to develop in the field of O-rings, gaskets, packings, valves, diaphragms, lubricant and hydraulic hose, roll coverings, and similar products.

11:05 A.M.—Business Meeting

11:20 A.M.—Charles Goodyear Lecture: Reflections on Rubber Research. *G. Stafford Whitby (University of Akron, Akron, Ohio).*

Thursday Afternoon—September 16

C. R. Haynes, Presiding

2:00 P.M.—14—Carboxylic Elastomers. *H. P. Brown and C. F. Gibbs (B. F. Goodrich Co. Research Center, Brecksville, Ohio).*

Carboxyl groups can be introduced into elastomers by adding olefinic acids to suitable emulsion systems prior to polymerization. In general such carboxyl groups elevate the elasticity temperature range, impart superior filming properties, increase resistance to swelling by hydrocarbon solvents and render the polymers susceptible to cross-linkage, gelation and vulcanization by polyvalent reagents. In vulcanization recipes based on sulfur but containing polyvalent metal salts the presence of as little as one percent of a carboxylic monomer is recognizable through its influence upon vulcanizate properties.

Carboxylic elastomers can be cross-linked by reactions of the carboxyl groups. Salt formation with zinc oxide without pigmentation gives stocks having stress-strain properties equaling or surpassing those of black pigmented sulfur cured vulcanizates of analogous non-carboxylic polymers. Several divalent metal oxides and other salts can be used as vulcanizing agents. The metal oxide vulcanizates possess excellent stress-strain properties but poor compression sets. Certain vulcanizates are improved by the inclusion of small amounts of organic acids. An excess of organic acid will cause devulcanization. Blacks function principally as loading rather than reinforcing pigments. The properties of vulcanizates of carboxylic elastomers of the butadiene, butadiene with acrylonitrile, butadiene with styrene, and ethylacrylate copolymer systems are described.

2:25 P.M.—15—Butyl-Type Polymers Containing Bromine. *R. T. Morrissey (B. F. Goodrich Co. Research Center, Brecksville, Ohio).*

Butyl-type polymers have been modified by introducing about 1.0 to 3.5 percent bromine on to the polymer chain. The polymers may be prepared by adding bromine to a solution of the butyl-type polymer. The reaction has been considered as mainly one of addition to the double bonds, thereby lowering the unsaturation of the butyl. Accelerator and sulfur requirements are consequently decreased while the cure rate of the polymer as compared to butyl is greatly increased. Both sulfur and metal oxide type cures are applicable to these bromine containing polymers. Unlike butyl rubber, the modified butyl can be co-vulcanized with natural rubber and GR-S, and thus it is now possible to impart the excellent properties of butyl such as ozone resistance, low air diffusion, and flex cracking resistance to these rubbers, while still maintaining good stress-strain properties. Still other advantages as compared to butyl rubber are higher modulus and good adhesion to other elastomers and metals.

Data are presented to show that the properties of these new butyl type polymers can be varied by the amount of bromine which they contain. It is also shown that an optimum amount of the halogen is required for the best properties both in mixtures with natural rubber and as an adhesive. This optimum amount of bromine also depends upon the original unsaturation of the polymer. The new butyl-type polymer is being made available to industry by the B. F. Goodrich Chemical Company under the commercial name, Hycar HH.

2:50 P.M.—16—Sulfur-Curable Silicone Rubber Compositions and Blends with Hydrocarbon Elastomers. *Dallas T. Hurd and Robert C. Osthoff (General Electric Research Laboratory, Schenectady, N. Y.).*

Silicone rubber gum stocks containing small percentages of silicon-bonded vinyl groups can be prepared by the copolymerization of polydimethylsiloxanes with polymethylvinylsiloxanes. These gums can be compounded with carbon black fillers and cured with conventional sulfur vulcanizing agents. Vinyl-containing silicone gum stocks can also be compounded in various proportions and covulcanized with hydrocarbon-chain elastomers such as natural rubber, GR-S, Butyl, or Perbunan. Since no "bleeding" occurs on long standing, the covulcanizates appear to be permanent. The measured properties of the blends are intermediate between those of the separate components. Certain of the Butyl-silicone covulcanizates appear to have superior electrical properties and an unusual degree of flexibility at temperatures as low as —50°C. It is anticipated that investigation of the preparation and properties of vinylsiloxane-hydrocarbon covulcanizates may yield information of value in determining the mechanism of the sulfur vulcanization of rubbers.

3:15 P.M.—17—Morphological Studies of Elastic Silicones. *Ernst A. Hauser (Massachusetts Institute of Technology, Cambridge, Mass.).*

This is the first report on the morphology of elastic silicones. This investigation deals with methyl-silicones only. They differ in their morphology from any synthetic elastic polymer investigated so far with the exception of Butyl rubber, which exhibits some similarity to the morphology of elastic silicones. Depending on the molecular weight distribution of the investigated elastic silicone, one finds the formation of broad bands, very fine threads, and some interspersed with very small globules. On the basis of already existing knowledge the conclusion may now be drawn that only such natural or synthetic elastic polymers will show the formation of very fine threads which permit the alignment of their molecules without too great difficulty.

Elastic silicones also show a similarity to the non-vulcanizable polyisobutylene. This becomes more and more noticeable as more of the lower molecular weight compound is used for the preparation of the silicone sample. It is therefore most probable that the methyl groups located at the surface of natural rubber, Butyl rubber, polyisobutylene, and methyl-silicones are mainly responsible for the formation of very fine threads which occasionally are interspersed with small globules. Photoultramicrographic demonstrations will be offered during the presentation of the paper.

3:40 P.M.—18—Fibrous Rubber—Its Production and Properties. *Worth Wade, Laurence R. B. Hervey, Derek E. Till and Ralph M. Winters, Jr. (American Viscose Corp., New York, N. Y.).*

A new physical form of rubber called fibrous rubber consists of a web formed of a multiplicity of small rubber fibers in random distribution and bonded together at their points of crossing. The web is formed by a modified spray process called fibrillation and can be produced from natural or synthetic rubber which is com-

pounded with the customary vulcanizing and curing agents. The fibers may be solid or hollow. The web is characterized by high porosity, high tensile strength, low density and high tear resistance as compared to foam, sponge and sheet rubber. Data are given for the elastic modulus, average diameters, tensile strength and elongation of the individual rubber fibers and of the web. Suggested uses are: cushion innersoles for shoes, pads for carpets, porous elastic wearing apparel, elastic bandages and rainwear which is water repellent but capable of passing water vapor.

4:05 P.M.—19—Amine Activators for Emulsion Copolymerization of Butadiene and Acrylonitrile. *J. W. L. Fordham and H. Leverne Williams (Research and Development Division, Polymer Corp., Ltd., Sarnia, Ont., Canada).*

The copolymerization of butadiene and acrylonitrile at 30°C. in emulsion using potassium persulfate as initiator is strongly activated by certain cyanoethylated amines, particularly dimethyl aminopropionitrile. As the temperature of polymerization is reduced other cyanoethylated amines which are more reactive are required. In particular the cyanoethylated ethanolamines are useful. If the cyanoethylated amine by itself is not a suitable activator the addition of a trace of ferrous iron may enhance its effectiveness greatly. The cyanoethylated amines can also be used when organic hydroperoxides such as cumene hydroperoxide are used as polymerization initiators especially if dextrose is included as a coreducer. The latter system may also be used for the emulsion copolymerization of butadiene and styrene whereas the former is very inefficient when butadiene and styrene are the sole monomers. One of the roles of glucose would appear to be the formation of glucoylamines resistant to cyanoethylation. The type of emulsifier used in the polymerization recipe markedly alters the shape of the time conversion curve. When long chain alkyl sulfonate or alkyl carboxylic acids are used the time conversion curve is linear. When other synthetic emulsifiers are used the time conversion curve is S-shaped; the reaction rate increases during the first several hours.

4:30 P.M.—20—Butadiene/Styrene Copolymers — 100% Conversion of Monomers. *T. W. Boyer and N. R. Legge (Kentucky Synthetic Rubber Corp., Louisville, Ky.).*

The removal of unreacted monomers from commercial butadiene/styrene polymerizations and the subsequent purification of the unreacted monomers are costly processes. Prior work to eliminate these processes by reacting to essentially 100% conversion of monomers showed depreciation of copolymer quality as the conversion increased. A re-examination of this problem is reported here.

In 41°F. emulsion copolymerizations of butadiene and styrene using iron pyrophosphate or sodium formaldehyde sulfoxylate activation systems with *para*-menthane hydroperoxide as initiator, the rate of reaction decreased significantly above 70% conversion. Additions of initiator or activator could not prevent this decrease in rate although the decrease was delayed somewhat. With the optimal reaction rates observed at 41°F., the decrease in rate at high conversions was sufficient to penalize over-all productivity of the quantitative conversion process by 30 to 40%—in comparison with the 60% conversion process. Gel-free copolymers produced at 100% conversion in the 41°F. system showed lower tensile and elongation than standard cold GR-S (41°F., 60% conversion) but were superior to standard hot GR-S (122°F., 72% conversion). Reaction rates were maintained by increasing the reaction temperature at high conversions.

Initial addition of modifier in this system produced a 100% conversion copolymer with tensile properties equal or inferior to standard 122°F. GR-S. Incremental addition of *tertiary*-dodecyl mercaptan (Sulfole) in the system resulted in a 100% conversion copolymer with tensile properties inferior to LTP GR-S but better than those of 122°F. GR-S. Incremental addition of modifier provides a better molecular weight distribution; i.e., less low molecular weight polymer than that found in systems containing large initial charges of modifier.

An 85% conversion copolymer produced in this manner was equivalent in tensile to LTP GR-S. In several experiments with this system the bound styrene content of the copolymer was maintained essentially constant throughout the entire range of conversion (0-100%) by additions of butadiene. These 100% conversion polymers showed no improvement in physical properties. Again a marked deterioration of tensile was noted above 85-90% conversion.

The authors conclude that 100% conversion copolymers which are better than 122°F. GR-S but inferior to LTP GR-S can be prepared in this 100% conversion system. These polymers would eliminate the costly stripping and monomer purification processes. The depreciated properties of high conversion (70-85%) polymers reported previously in the literature are believed owing to the effects of molecular weight distribution rather than high conversion per se. (NOTE: The work reported herein was sponsored by the Reconstruction Finance Corporation, Office of Synthetic Rubber, in connection with the government synthetic rubber program.)

Friday Morning—September 17

J. Ball, Presiding

9:00 A.M.—21—The Analytical Determination of Some Elastomeric Components in Aqueous Extracts. *K. Marcali (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).*

The use of elastomers such as neoprene, GR-S, natural rubber and butadiene acrylonitrile polymers in the manufacture of specialty papers has become of increasing importance in recent years. Since generally the addition of an appropriate elastomer appreciably increases the tensile, burst, fold and tear strength of paper, diversified applications have been found for these papers for many essential services such as food wrappers. This application requires reliable information on the extractability of elastomer components into various types of solvents, particularly for trace amounts of those components which are used in the manufacture of synthetic elastomers. This paper will discuss sensitive accurate analytical methods for the determination of zinc, phenothiazine, p-tertiary butylcatechol, a disproportionated rosin, and the sodium salts of 1,1'-methylene-di-2-naphthalene sulfonic acid and 2-anthraquinone sulfonic acid. The chemistry, principle, technique, and general application will be presented.

9:20 A.M.—22—Identification of Curing Agents in Rubber Products—Ultraviolet Absorptiometric Analysis of Selective Solvent Extracts. *K. E. Kress and F. G. Stevens (Firestone Tire & Rubber Co., Akron 17, Ohio).*

A new method has been devised to identify organic compounds which accelerate or retard the vulcanization of commercial rubber products. The organic curing agents are normally acidic or alkaline and can be selectively extracted from a complex compounded commercial rubber stock with dilute aqueous alkali or acid solutions. Identification is made by obtaining characteristic ultraviolet absorptiometric curves over the 220m to 380m region on the aqueous alkali or acid solutions, or on liquid-liquid ethyl ether extracts of the aqueous solutions. When extracted curing agents do not exhibit characteristic absorbance maximum, formation of a related compound by simple chemical treatment has made this method applicable to identification of nearly all common organic accelerators used in rubber products today. The method has been applied to identification of thiazole, thiuram, thiocarbamate, amine and guanidine classes of commercial accelerators (and some cure retarders) in cured and uncured rubber products. Interference of common softeners and antioxidants is usually negligible. The procedure outlined is simple and more rapid than isolation by chromatographic procedure. It is much more sensitive and specific than chromatography of colored products or spot tests of chromatographic fractions. Identification of common accelerators in a rubber stock is regularly made with a two gram sample in less than four hours.

9:40 A.M.—23—The Identification of Accelerators and Antioxidants in Vulcanized Rubber Products. *M. J. Brock and George D. Louth (Firestone Tire & Rubber Co., Akron 17, Ohio).*

A new approach to the identification of the accelerators used in vulcanized rubber products is described. The procedure includes the separation and identification of amine type antioxidants. The problem of accelerator decomposition or transformation during mixing, vulcanization and extraction has been simplified by an extraction technique which promotes accelerator decomposition. It is shown that most accelerators are composed of one or more of the following constituents: (1) 2-mercaptobenzothiazole (or other thiazole), (2) a guanidine, (3) CS_2, or (4) an amine. These accelerator fragments are collected, separated and identified. The detection of a thiazole, a guanidine or CS_2 immediately classifies the accelerator as to type, namely, (1) a thiazole, (2) a guanidine, or (3) a thiuramsulfide or dithiocarbamate. The specific amine identified, if any, designates the particular amine activator, sulfenamide, thiuramsulfide or dithiocarbamate used. Thus the accelerator used can be determined by the accelerator fragments or combination of fragments identified.

It should be emphasized that no more than four routine identifications are required to identify or classify not only the twenty-four accelerators included in this study but any others which may be composed of the same general constituents. In the method proposed, the amine portion of the accelerator is separated by aqueous distillation. It is identified by an X-ray diffraction method previously described. The guanidine accelerators are separated in the basic fraction of the liquid-liquid extraction procedure and identified by their X-ray diffraction diagrams.

2-Mercaptobenzothiazole and other acidic thiazoles or related compounds occur in the acid fraction, and the amine antioxidants are found in the neutral fraction. These components are identified by their ultraviolet absorption characteristics. Carbon disulfide is isolated and identified as the copper xanthate. The method has been applied successfully to both vulcanized and unvulcanized rubber products. It is equally useful in the analysis of compounded latex, latex products and rubber cements. Twenty-four different accelerators and twelve different antioxidants have been studied. Advantages and limitations of the method are discussed.

10:05 A.M.—24—The Stoichiometry and Fate of Oxidation Inhibitors in Benzene and Chlorobenzene. *Charles E. Boozer, George S. Hammond, Chester E. Hamilton and Jyotirindra N. Sen (Iowa State College, Ames, Iowa).*

The chemistry of the changes which take place in an antioxidant in its role of protecting an elastomer from oxidation has been the basis of extended research. Such work is most advantageously carried out in model type compounds rather than in the elastomer itself. The inhibiting effects of 17 phenols and amines on the autoxidation of cumene catalyzed by azo-bis-isobutyronitrile have been studied. All of the inhibitors studied gave reasonably well defined inhibition periods which were proportional to the inhibitor concentration and inversely proportional to the initiator concentration at any given temperature. The stoichiometry of the inhibition reactions were determined by isolating the products from two of the inhibitors and comparing these inhibitors with the others. Consistent and reasonable stoichiometric factors were determined for most of the inhibitors.

10:30 A.M.—25—Determination of Latex Particle Size by Adsorption of Electrolytes. *S. R. Ogilby (Goodyear Tire & Rubber Co., Akron 16, Ohio).*

Several synthetic and natural rubber latices were carefully measured by conventional electron microscope techniques and their average particle size calculated as Volume Surface Average Diameter ($D\bar{V}_s$). These latices were titrated conductometrically with electrolytes at pH levels low enough to inactivate their soap stabilizers. Their stabilities were maintained by the addition of a non-ionic stabilizer. The titration values were resolved to latex particle size by the use of the Gibb's Adsorption Theory. This theory assumes equal surface coverage per molecule adsorbed, thus making it unnecessary to explain the results obtained in terms of either deformed molecules or condensed mono layers at the water hydrocarbon interface. It also accounts for the results obtained with varying molecular sized adsorbents. Several calculations from these titrations indicate that some of the prevailing theories regarding the surface area covered by soaps should be reconsidered.

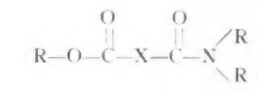
11:00 A.M.—26—Dry Compounding vs. Latex Masterbatching of Oil-Extended GR-S. *F. S. Rostler and R. M. White (Golden Bear Oil Co., Oildale, Calif.).*

Experience with oil extended GR-S as recorded in the literature and revealed in discussions with workers in the field is in many cases quite contradictory. The investigation reported in this paper traces the cause for this discrepancy in findings to the assumption made by most investigators that the properties of oil extended polymers of the same composition are independent of the method of incorporation of the oils. The data presented in this paper show that this assumption was erroneous, and that the method of incorporating the extenders has a considerable bearing on the properties of oil extended polymers. Parallel series of oil extended compounds were tested: one series in which extenders of different composition were added in the latex stage, and one in which the same extenders were added by dry mixing. Oils of widely different composition were used in order to accentuate the influence of the type of extender.

Effect of method of incorporation of the extender was primarily on the uncured stock. Oils containing high amounts of N-Bases are shown to be suitable extenders for dry compounding, giving good properties, cured and uncured, while the same concentration of N-bases is detrimental in extenders used in latex masterbatching. Low Mooney viscosity values and poor storage stability are characteristic for these latex cocoagulates. It is noteworthy on the other hand that such low Mooney cocoagulates have high physical properties in the cured state. This behavior of extenders is of particular interest since the current Office of Synthetic Rubber, Reconstruction Finance Corp., specifications permit extenders with the percentage of N-bases found to be detrimental, to be used for latex masterbatching.

11:20 A.M.—27—Alkyl Amates as Elastomer Plasticizers. *Arthur William Campbell (Commercial Solvents Corp., Terre Haute, Ind.).*

The amic acids comprise a large group of compounds that have not been investigated heretofore as elastomer plasticizers. The work reported here describes the exploratory work both on methods of preparation and application. The alkyl esters of dialkyl amic acids have the following as a representative formula:



where X is zero or any convenient number of methylene groups. The amates were tried and found to be effective as plasticizers in natural rubber, GR-S, butadiene acrylonitrile and polyvinyl chloride polymers. Three methods of preparation will be described and the tests on approximately twenty new compounds reported.

11:40 A.M.—28—A Bis-Alkylation Theory of Neoprene Vulcanization. *Peter Kovacic (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).*

About 1.5% of the chlorine in neoprene is in a labile form removable by piperidine through a substitution mechanism resulting in a nitrogen-containing polymer. The polymer freed of active chlorine is not vulcanized by many of the common neoprene vulcanizing agents, such as ethylene thiourea, the di-*o*-tolylguanidine salt of dicatechol borate and *p,p'*-diaminodiphenylmethane. Vulcanization of the treated neoprene can be effected by sulfur, *p*-dinitrosobenzene, 4,4'-methylene di(phenylisocyanate) or labile dihalides, e.g., 1,4-dichloro-2-butene. Correlations are

made between the nature of the cross-linking agent and the functional groups present in the polymers. It is proposed that vulcanization of neoprene with certain reagents occurs through bis-alkylation of the cross-linking agent, e.g., *p,p'*-diaminodiphenyl methane, by polymer chains at the active chlorine positions. Catalysis of the cross-linking reactions is discussed.

Friday Afternoon—September 17

J. Breckley, Presiding

2:00 P.M.—29—Inhibition of Rubber Oxidation by Carbon Black. *C. W. Sweitzer and K. A. Burgess (Columbian Carbon Co., New York, N. Y.).*

In previous publications from these laboratories it has been shown that the presence of small amounts of carbon black in cold rubber represses the gelation of the polymer during prolonged hot Banbury mixing. This repression has been attributed to inhibition by the carbon black of the oxidative reactions which produce gelation. In the present paper the results of further investigations on this inhibition property of carbon blacks are disclosed, involving both gelation and scission reactions in a series of polymers, with particular emphasis on the physical properties of the compounded stocks. Prolonged cool Banbury mastication of LTP GR-S results in lower Mooney viscosities due to excessive scission of the polymer chains. Stocks compounded from this rubber give lower tensiles. The addition of small percentages of carbon black during the mastication stage were found to minimize this drop in Mooney viscosity and tensile.

Similarly, prolonged hot Banbury mastication of LTP GR-S develops higher Mooney viscosities due to pronounced cross-linking or gelation in addition to the scission reaction. Stocks compounded from this rubber develop modulus levels well above those of normally mixed stocks. The presence of small dosages of carbon black during the mastication stage has been observed to suppress these increases in Mooney viscosity and modulus. It is evident that this effect of carbon black in inhibiting rubber oxidation reactions during prolonged mastication has a profound influence on the properties of the final vulcanizates. The results of similar investigations with other polymers are also described, these polymers including natural, Butyl and oil-extended LTP GR-S. The oxidation inhibition property of carbon black is also compared to that of standard chemical antioxidants.

2:25 P.M.—30—Rubber-Filler Interactions—Solution Adsorption Studies. *E. R. Gilliland and Edgar B. Gutoff (Massachusetts Institute of Technology, Cambridge, Mass.).*

The equilibrium adsorption of several polyisobutylenes and Butyl rubber from dilute benzene solutions on different fillers was studied. On Hi-Sil no adsorption was detectable, while on a medium processing channel black slight adsorption occurred. The elastomers were appreciably adsorbed, however, by a high abrasion furnace black. The adsorption per unit weight HAF black decreased with temperature and increased with the molecular weight of the polymer. The high molecular weight polymers were very preferentially adsorbed, to the extent that molecular weight distribution curves of the elastomers could be constructed. With the lower molecular weight polymers, increasing the solution concentration increased the adsorption, but, in the range 0.25-1%, concentration had no effect on the adsorption of the higher molecular weight materials. In all cases, the GR-I-25 (Butyl) behaved according to its molecular weight, indicating no effect of unsaturation. Extracting the black-polymer samples with benzene in Soxhlet extractors removed some but not all of the adsorbed polymer from the black. Milling caused the GR-I-25, and to a lesser extent the polyisobutylene, to be highly adsorbed on the MPC black, but did not effect adsorption on the HAF black.

It is felt that the adsorption of polyisobutylene and Butyl rubber by the HAF black is essentially physical, but of a very strong nature, and that this physical adsorption may plan an important role in reinforcement. The oxygenated channel blacks seem to physically adsorb very little material, but, under milling conditions, react chemically with the unsaturated groups of the polymer.

2:50 P.M.—31—The Surface Treatment of Hydrated Silica Pigments for the Reinforcement of Rubber Stocks. *R. S. Stearns and B. L. Johnson (Firestone Tire & Rubber Co., Akron 17, Ohio).*

The effect of particle size, surface area, particle shape and particle dispersion on the reinforcing ability of finely divided solids in crosslinked elastomers has been extensively investigated. The chemical properties of a surface and its effect on the reinforcing ability of a filler is of primary importance. The introduction of organic groups onto the silica surface through reaction with silanes provides an excellent means of altering the chemical properties of a solid surface. In this manner a series of reinforcing materials of constant area but of differing reactivity may be produced. Through the evaluation of the work of retraction of a series of stocks containing various surface treated silicas, it is demonstrated that modulus reinforcement is dependent on the immobilization of polymer chains at the polymer filler interface. This immobilization is the result of free radical type reactions taking place during high temperature mixing and vulcanization. It is shown that the reinforcing ability of a finely divided solid is dependent on the number of sites on the solid surface and their reactivity.

3:15 P.M.—32—The Geometric Construction of Copolymer Solvent Phase Diagrams. *F. W. Boggs (U. S. Rubber Co., New York, N. Y.).*

The resistance of elastomers to the action of various solvents is a matter of increasing importance in rubber technology. Because of this, simple methods of summarizing the action of solvents on copolymers should be useful. The general properties of the triangular phase diagram of copolymer solvent systems were discussed in a previous paper. Here the qualitative aspects of these diagrams will be related to the partial molar heat of solution of the copolymer. Further it will be shown that the phase diagram can be calculated if the heat of solution of the polymer is known for all compositions.

This fact having been established it becomes possible to construct the phase diagrams geometrically. This procedure is particularly simple if we use interaction parameters of the type which have previously been found applicable to liquid and polymer systems. The values of the solubility parameters can then be related to the type of phase diagram and this permits rapid visualization of the solubility properties of copolymers and makes it possible to construct phase diagrams for a wide variety of systems from a very small amount of initial data. It is hoped that this will help expedite the evaluation of solvent resistant rubbers.

3:40 P.M.—33—Polymer Networks Formed in the Presence of Diluent. *R. M. Pierson, A. J. Costanza and F. J. Naples (Goodyear Tire & Rubber Co., Akron 16, Ohio).*

Intra-molecular cross-links are known to form when polymers are cross-linked in the presence of inert diluents. The present study was undertaken to determine the extent of the intra-molecular cross-linking as a function of the type and amount of diluent, and to find whether elastomer networks which contain an appreciable proportion of intra-molecular links have resilience properties (after removal of diluent) which are significantly different from networks formed in the absence of diluent.

Flory's quantitative cross-linking agent, decamethylene dimethyl p-1-azodicarboxylate, was first used with both rubbery (high diene content) and resinous (high styrene content) polymers in the presence of diluents such as benzene in order to prepare networks whose swelling volumes could be used as rough criteria of the relative amounts of inter-molecular ("effective") and intra-molecular ("ineffective") cross-links. When the results were expressed in terms of the ratio of the "apparent Mc" (molecular weight between cross-links formed in the presence of diluent) to the Mc obtained in the absence of diluent, values of this ratio in excess of 4 were found at diluent polymer levels as low as 1:1.

Sulfur-cured gum stocks of high molecular weight Alfin and emulsion butadiene type elastomers were then prepared in the presence of 25-200 parts of a conventional extender oil and their

resilience properties determined both before and after extraction of oil. Resilience values of the extracted stocks (which contained intra-molecular links in proportion to the amount of oil originally present) were appreciably higher than were those obtained on a series of stocks cured to a range of cross-link densities in the absence of oil, when comparisons were made at equal swell volumes. Thus, the presence of intra-molecular links in tire stocks of oil extended rubbers appears to be an important factor in accounting for their excellent service performance.

4:05 P.M.—34—Recent Developments in Rubber-To-Metal Bonding. *Howard H. Irvin and W. H. Cornell (Marbon Corp., Gary, Ind.).*

Although for many years brass plating had been the accepted method for obtaining a bond between rubber and steel during vulcanization, resin type adhesives began to make their appearance on the market about 1939. These new adhesives were rapidly adopted for many applications and did an excellent job during the war years, when they were used for bonding practically all tank block tread assemblies. Having done a great deal of the pioneering work in the field of rubber-to-metal adhesives in the late 1930's, the laboratories of the Marbon Corporation set out several years ago to develop a new bonding system which would bond most of the stocks that would be encountered in a rubber plant, and at the same time would be insensitive to atmospheric conditions (unaffected by ozone, humidity and temperatures) and to curing cycles (time and temperature). Such a bonding system has now been developed and is being marketed as Ty Ply "UP" (Universal Primer) and Ty Ply "RC" (Rubber Cover Coat). This two-coat system will bond most natural rubber and GR-S stocks including Arctic and oil extended types, and certain nitrile rubber stocks. Ty Ply "UP" will also effectively bond neoprene stocks.

Data on the effect of metal preparation, exposure to ozone or high humidity, and the effect of curing conditions, compound structure and elastomer plasticity on bond strength are described in detail. Work has been done to investigate the feeling existing in many quarters that brass plating was to be preferred to adhesive bonding because of greater bond strengths at elevated temperatures and better resistance when subjected to dynamic stresses. Comparative data are presented on rubber-to-metal bonds prepared by brass plating and by the Ty Ply UP/RC system, subjected to elevated temperatures, static shock loading, and dynamic stress. The results confirm the effectiveness of the adhesive system under these conditions.

4:30 P.M.—35—Variations in Processing and Physical Properties of Oil Masterbatches with Increasing Oil Content. *W. K. Taft, B. G. Labbe and R. W. Laundrie (Government Laboratories, University of Akron, Akron, Ohio).*

A systematic study was undertaken to demonstrate the effect of oil concentration in masterbatched polymers on their processing properties as well as the physical properties of their vulcanizates compounded with three types of blacks at different black loadings. The best balance of physical and processing properties seems to be with raw masterbatch polymer having a Mooney viscosity of about 60 ML-4.

When the Mooney viscosity of the raw masterbatched polymer was lowered by adding more oil, poorer stress-strain, rebound, temperature rise, and hardness properties, and lower Banbury temperatures and power consumption resulted with little change in roughness and mill shrinkage. Maintaining higher viscosities of the raw masterbatched polymer by adding less oil affected these properties in the opposite manner. The use of more oil, up to 90 parts to produce lower viscosity masterbatches, improved the Garvey die extrusion, but the use of less oil reduced the extrusion characteristics to the point of being impractical. Reduction of the viscosity by adding more oil increased the optimum cure times, and undoubtedly reduces scorchiness.

With masterbatches of equal Mooney viscosity, compounding with an increase in sulfur, depending on the oil content, and a constant acceleration level, regardless of oil content, resulted in a reasonably linear decrease in the following with the increase in oil used: tensile strength, modulus, temperature rise, degree of scorchiness, dump temperature, power consumption, Mooney viscosity of the compound stock, and Shore A hardness. The elongation, rebound, optimum cure, possible flex life, and Garvey die extrusion index tended to increase with increasing oil extension. The other properties did not change significantly with the amount of oil used in masterbatching.

Again with masterbatches of equal Mooney viscosity, compounding to approximately equal hardness by varying black loading did not alter significantly the above mentioned trends. Increasing the state of cure of the highly extended polymers by increasing the acceleration level rather than the sulfur level seemed to be preferable as a means of increasing the hardness, modulus and rebound, and decreasing the temperature rise, elongation, set and time to optimum cure with some loss in flex life, but little or no loss in tensile properties. (NOTE: The work discussed herein was performed as a part of the research project sponsored by the Reconstruction Finance Corporation, Office of Synthetic Rubber, in connection with the government synthetic rubber program).

Reports on Avoidable Accidents in Rubber Factories

FROM time to time we publish reports on avoidable accidents in rubber factories based on actual conditions. These reports are prepared by the Rubber Section of the National Safety Council. Some of the more recent reports follow herewith:

Plasticator Accident: A serious accident in a plant recently resulted in a lost arm. The employee was operating a plasticator that had been in use for 16 years in the plant. This machine was equipped with a safety cable located approximately 16 inches above the opening. The operator apparently was pushing on the rubber to force it into the screw when his hand became caught in the rubber and was pulled into the machine. The arm was pulled from its socket at the elbow and the operator stated that he had difficulty reaching the safety cable because his body was turned away from the machine when his hand was caught. To prevent a similar accident, the platform in front of the machine has been removed and a barrier installed in front of the opening to the platform so that it is almost impossible to reach into the area above the screw, the Rubber Section reports.

Overhead Door Accident: Employee was working in area of a plant that was near an outside door. Feeling cold, he noticed that an overhead door nearby was open, so he walked over and pushed the down button to lower the door. At that very moment, an industrial truck driver on his truck was approaching the door from the outside entrance. He did not notice that the door was lowering, and as the truck entered the building this overhead door dropped on the overhead guard of the truck that is installed to protect the operator from falling stock. Although the door was broken, the operator was not injured.

This non-injury accident has in still another way shown the value of truck overhead guards. It has also shown the need for constant pressure or hold buttons for operating overhead doors rather than the type of control that can be actuated and then left uncontrolled while it is in movement.

Editorials . . .

European Synthetics

PARIS, France, August 2

AS indicated previously in these columns, the entire rubber manufacturing industry is anxiously awaiting the result of the negotiations now being conducted by the Synthetic Rubber Producing Facilities Disposal Commission and the companies which have submitted bids for the various facilities. Once these negotiations have been completed, the Commission will be able to formulate a complete package program for presentation to Congress in accordance with the Disposal Law. The ultimate fate of synthetic rubber production in the United States hinges on the approval or disapproval of the package program by Congress.

The proceedings are being carefully observed not only by rubber manufacturers, but equally by manufacturers throughout Western Europe. Practically every manufacturer in England and on the Continent is using synthetic rubber of one type or another, imported either from the United States or Canada. Most of the imported synthetic comes from Canada because of the excellent sales promotion job which the Polymer Corporation has obviously performed. GR-S is used in most passenger tires made in Western Europe and practically all passenger tubes are made of Butyl. Tubeless tires, with inner linings of Butyl, are now being merchandised throughout the high and low countries.

With synthetic rubber now being used throughout Western Europe almost in the same proportion as it is in the United States, it is not surprising that a good deal of attention is being given to the possible production of various types of synthetic rubber, particularly GR-S and Butyl. Our readers are familiar with the start made in this direction in England, where plans for the early production of GR-S have been announced by Dunlop and similar plans for high styrene resins by both Imperial Chemical Industries and Monsanto Chemicals, Ltd. No tremendous output is contemplated by these companies, but it is reasonable to assume that respectable quantities will be produced when the time is ripe. The know-how gained in the early production will prove invaluable for the larger-scale operations in the future.

There is hardly a rubber manufacturer in Western Europe which has not been investigating the possibilities of synthetic rubber production and delving deeply into the minimum quantities which might be economically produced. It is this question of the economic minimum which has thus far deterred some of these manufacturers from going ahead with specific plans, since most of them agree that anything less than 10,000 to 15,000 tons of GR-S per year would be too costly, since the cost per pound would be greater than the import cost from the United States or Canada. While such annual production would easily be consumed by any one of the large tire plants in the United States, by European standards it is rather a large amount.

There is also a definite feeling in Western Europe, at least in some quarters, that synthetic rubber production should be cartelized, that is to say that it should be accomplished on an-all European basis, similar to coal operations under the Schuman Plan. Proponents of this system point out that under such a plan maximum amounts of each type of synthetic could be produced in one specific country and the price could be fixed throughout Western Europe. For example, they say, GR-S could be produced in Italy, Butyl rubber in France, the nitrile rubbers in West Germany, the specialty rubbers in another country, etc., with the ultimate decisions dictated by sources of raw material supply. They argue that plant locations will be immaterial, since the same prices will apply to all countries. As for operation of the respective plants, they insist that special companies could be formed representing both the large and small rubber manufacturers in the various countries.

Anything that resembles a cartel in any manner, shape or form is contrary to the American system, but it must be borne in mind that Western Europe comprises a number of large and small countries and the problems of the rubber manufacturing industries of these countries are somewhat different from our own. Competition is considerably keener, since many manufacturers must depend on export for survival, even though such export sometimes means a matter of only a few hundred miles. Then, too, in practically every country in Western Europe there is one rubber concern which dominates the field, although such domination is being subjected to more challenge with each passing year.

We are not advocating the idea of a cartelized synthetic rubber industry in Western Europe, but are simply pointing out current thinking along these lines. The major point involved is that sooner or later synthetic rubber will be produced in Western Europe on a considerable scale, and accordingly, the export market which currently exists will reach a vanishing point. Any American manufacturer who expects to produce synthetic rubber on an independent basis in the future would do well to base his calculations solely on the domestic market.

This timely editorial on the European synthetic rubber situation was written by our Editor, M. E. Lerner, just prior to embarking from France after an eight-week tour of European rubber factories.

The Publishers

Highlights Sidelights *of the News . . .*

August, 1954

Laurence Robbins, head of the Federal Facilities Corporation, in his recent report to the House Appropriations Committee, estimated that net income from the government's synthetic rubber operations in fiscal 1954 would amount to $43,400,000 (page 705) . . . This is a $16,500,000 drop from net income in fiscal 1953. It will be remembered that in the President's budget message of January 21, 1954 (see RUBBER AGE, February, 1954), it was estimated that net income from the synthetic plants in fiscal 1955 would be $48,500,000. The latest FFC estimate for that year places estimated net income at an even $50,000,000.

FFC also advises that sales of GR-S will be on the increase for the next several months (page 705) . . . October, however, will see a decline, something like 4% under estimated sales of 48,000 long tons in September. During June, the government sold approximately 33,000 long tons of GR-S, the lowest monthly total in several years.

Stockholders of the Sponge Rubber Products Co. were to have voted on the purchase of their company by Goodrich late in July. Directors of the company have already voiced their approval and no difficulty was expected in completing the transaction (page 707) . . . Purchase of Sponge Rubber Products gives Goodrich a prime producer of chemically blown sponge, latex foam and expanded plastics.

The industry is awaiting the outcome of the Goodyear strike to see what pattern will be set (page 711) . . . URW negotiators are reported to be standing pat on a 12-3/4¢ "package" demand, which includes 7-1/2¢ an hour for a general wage increase and 5-1/4¢ for correction of intra- and inter-plant wage differentials . . . Industry is said to be offering a flat 5¢ an hour boost . . . At this writing, no change in position on either side has been announced.

The recent expansion program announced by Dunlop Tire in an "all-out" bid to capture a major share of the tire market in the U. S. will cost the company about $5,000,000 (page 715) . . . The program involves new management, modernization and stepped-up production.

NEWS REPORTS and Industry Activities

1954 GR-S OPERATIONS MAY NET $43,400,000; FFC EXPECTS 4% GR-S SALES DROP IN OCTOBER

THE Federal Facilities Corporation, operator of the government's 27 synthetic rubber plants, has estimated GR-S sales for next October at 46,000 long tons, 4% below the estimate for September. The predicted sales decline comes after a period of estimated increases beginning in July, when sales were estimated at 38,000 tons. During June, the government sold approximately 33,000 long tons, the lowest monthly total in several years. The government bases its sales estimates on orders by large customers who are required to make firm commitments 90 days in advance of delivery.

Laurence B. Robbins, head of FFC, in a recent report to the House Appropriations Committee, stated that the government-owned plants cleared a net income of $59,900,000 in fiscal 1953, compared with $16,100,000 in fiscal 1952, and are expected to net $43,400,000 in fiscal 1954. The profits shown to date, said Mr. Robbins, were figured after all charges for depreciation and interest in investments and "everything a normal business operation charges, with the exception, of course, of Federal income taxes." Senator Homer Capehart (Rep., Ind.), said during debate on the proposal to sell the plants to private industry that their profits would have been halved if they had been required to pay the corporation taxes levied on private firms.

The following table sets forth an estimate of FFC's production and sales for the three months' period ending October, 1954. These figures include the oil used in oil-extended rubbers, but exclude the carbon black masterbatches.

Month	Production	Sales
August	39,000	44,000
September	40,500	48,000
October	42,200	46,000

Plant Sale Problems

According to recent published reports, the government is facing a more difficult task than is generally believed in trying to sell the government-owned synthetic plants. Despite an impressive number of purchase proposals, well-informed observers declare that plant-for-plant, there has been surprisingly little competitive bidding.

All told, 75 separate bids were received, including 56 primary bids and 19 alternative (second choice) bids. Even excluding the alternate proposals, the figures seem to indicate an average of two bids per plant. According to unofficial sources, however, there is more to the story than is apparent on the surface.

It is reported that of the 27 plants offered for sale, only five drew more than one bid, while 19 drew only a single bid each. The remaining three, including the Institute, W. Va., copolymer facility, now in "standby," drew no bids at all.

The five plants for which two or more firms are competing include the only styrene plant owned by the government. That plant is reported to have drawn 11 bids from as many prospective buyers. On the other hand, only 1 of the 13 copolymer plants drew more than one bid. Like the styrene plant, that copolymer plant is located near Los Angeles. Trade reports state that four bids were entered for this facility.

The 8 petroleum-butadiene plants are supposed to have drawn bids from 14 firms, with at least three of the plants drawing more than one bid each. It is generally expected that in subsequent modifications to submitted bids for the butadiene plants, and perhaps others, some drastic changes will take place as negotiations proceed.

Several firms which entered separate bids on the same facility are reported to be joining to buy the facility together. Should this occur, it is believed that the Disposal Commission, with more customers than butadiene plants, may still be able to obtain a relatively high price for the facilities.

The trade believes that the sale of the styrene plant should be a relatively easy job, and little difficulty is expected in selling the two Butyl rubber plants. In addition, Congress has authorized the Disposal Commission to lease, if it cannot sell, the two alcohol-butadiene plants. Both of these "high cost" facilities are in standby.

The greatest difficulty, it is believed, will be in selling the copolymer plants. The Disposal Commission is said to believe that the initial bids offered may be subject to later increase. At least one company, it is known, entered what appears to be a token bid for a copolymer plant, with the knowledge that the bid can be increased at a later date.

Except for the plant on the West Coast, there are said to be fewer firms after copolymer plants than there are plants available for sale. This may leave the Disposal Commission in a position where it may have to accept less for the plants in order to sell them. Under the law, the Commission could also recommend to Congress that the plants not be sold after all.

Under the disposal law, not all the plants have to be sold. If the majority are sold, those remaining will be "mothballed." A given company, knowing it has the only bid in for a facility, runs the risk of losing out entirely if it is too unyielding in refusing to meet the Commission's idea of an adequate sale price.

The trade also believes that the Institute plant, despite its drawbacks may yet find a purchaser. The disposal law permits bidders to switch from one plant to another within the same major group, such as the copolymer plants.

Thus, the Commission is said to hold the hope that with final negotiations still some months distant, it may be able to get some bidders to take the less desirable plants if they lose out on their first choice.

The Commission is far from convinced that the initial bids entered in late May are the last it will see from prospective customers. The government negotiators are all set for what they term a "slow auction."

Bidders and Properties

While the Disposal Commission has made public only the names of the bidders and the total number of bids, private observers have drawn up a list linking bidders with some of the properties on which they have entered primary bids. This list follows:

Copolymer Plants: Louisville, Ky., 40,000 tons (American Synthetic Rubber Corp.); Baton Rouge, La., 49,000 tons (Copolymer Corp.); Lake Charles, La., 96,600 tons (Firestone Tire & Rubber Co.); Akron, Ohio, 30,000 tons (Firestone Tire

& Rubber Co.); Baytown, Texas, 44,000 tons (General Tire & Rubber Co.); Port Neches, Texas, 90,000 tons (Goodrich-Gulf Chemicals, Inc.); Houston, Texas, 99,600 tons (Goodyear Synthetic Rubber Corp.); Akron, Ohio, 15,200 tons (Goodyear Synthetic Rubber Corp.); Los Angeles, Calif., 89,000 tons (Midland Rubber Corp., Minnesota Mining & Manufacturing Co., Edwin W. Pauley, and Standard Oil Co. of Calif.); Borger, Texas, 66,000 tons (Phillips Chemical Co.); Port Neches, Texas, 89,400 tons (U. S. Rubber Co.), and Naugatuck, Conn., 22,000 tons (U. S. Rubber Co.).

Petroleum - Butadiene Plants: Lake Charles, La., 60,000 tons (Petroleum Chemicals, Inc., Climax Molybdenum and Merck & Co.); Baton Rouge, La., 23,000 tons (Copolymer Corp.); Port Neches, Texas, 197,000 tons (Goodrich-Gulf Chemicals, Inc., Texas Co., and the General Chemical Division of Allied Chemical & Dye Corp.); Houston, Texas, 78,000 tons (Sinclair Refining Co., W. R. Grace & Co., and General Chemical Division of Allied Chemical and Dye Corp.); Baytown, Texas, 49,000 tons (Humble Oil & Refining Co.); Borger, Texas, 71,200 tons (Phillips Chemical Co.); El Segundo, Calif. [a tandem operation with the Los Angeles copolymer plant] (Standard Oil Co. of Calif.); Los Angeles, Calif., 61,000 tons (Shell Co.), and one bid from the Food Machinery & Chemical Corp. for an undetermined facility.

Styrene Plant: Los Angeles, Calif., 57,000 tons (American Chemical Corp., Dow Chemical Co., Foster Grant Co., Hercules Powder Co., Heyden Petroleum Corp., Koppers Co., Monsanto Chemical Co., Montrose Chemical Co., National Lead Co., Shell Chemical Corp., and W. R. Grace & Co.).

Butyl Plants: Baton Rouge, La., 47,000 tons (Esso Standard Oil Co.); Baytown, Texas, 43,000 tons (Humble Oil & Refining Co.).

Miscellaneous bids are said to include a bid to purchase tank cars by J. G. Milligan & Co., a bid by the Great Southern Chemical Corp. to buy about $1,000,000 of butylene feedstock facilities installed by the government at the company's petroleum refinery at Corpus Christi, Texas, and a bid by Publicker Industries, Inc., to lease the 87,000 ton alcohol-butadiene plant at Louisville, Ky.

Increased Synthetic Needs

In the opinion of some in the trade, the increased needs for rubber in the next few years will have to be suppied by new synthetic rubber plants, rather than by natural rubber plantations in the Far East. Such new synthetic construction may be needed as early as 1956, if requirements rise rapidly due to boom conditions, or if the supply of natural rubber is cut off or reduced by war or unsettled conditions in the Far East.

One economist, Dean Carson, director of the Bureau of Research of the B. F. Goodrich Co., stated in a recent interview, he was convinced that natural rubber output in 1960 would be no higher than it is today. Mr. Carson recently returned from a visit to the Far East.

Develops New Rubbers

University of Illinois scientists have announced the development of two new synthetic rubbers which are said to offer promise for heavy duty truck and airplane tires. It was said that the government laboratories at the University of Akron are now producing sufficient quantities of the new synthetic rubbers to put them through evaluation tests in actual tire use. One of the new rubbers is called "sodium rubber" because sodium is used as a catalyst in its manufacture. The other employs benzalactophenone, which is described as a "substitute styrene." The scientists state that both rubbers exhibit low heat build up, a necessary quality for heavy duty tires. It was also stated that a third synthetic rubber, now in the process of development, shows promise for use in Arctic regions. This rubber does not get brittle even at temperatures 50° below zero, it was said.

About the best that can be expected, according to Mr. Carson, is that the rubber-growing areas will make enough new plantings to replace old and diseased plants. In some areas, he said, Communists have been stimulating unrest among workers. Strikes are frequent, and productivity has declined sharply. In Indonesia, workers are on a seven-hour day, including portal-to-portal pay calculated from the time the worker leaves his home in the morning until the time he returns at night. In view of the risks, Mr. Carson says, it is not surprising that investments in new plantings have been curtailed.

By 1960, Goodrich economists estimate, world consumption will total about 3,000,000 tons, of which 1,600,000 will be accoun'ed for by the United States. Of the 3,060,000 tons required, 1,600,000 to 1,700,000 will be provided by natural rubber. The balance will have to be supplied by the synthetic rubber plants. Present capacity in the United States is about 860,000 long tons.

The 1,600,000 tons of new rubber that will be needed by 1960 in the United States represents a gain of 28% over current rates of consumption. The rise in rubber consumption has been fairly steady. Consumption in the United States has increased from about 375,000 tons in 1930 to 900,000 tons in 1949. The growth in demand between 1949 and 1960 will be about 62%, it is estimated.

Research in Latin America

According to current reports, supplies of natural rubber may yet be accelerated. It has been revealed that White House and Congressional intervention have assured another try at reconciling an inter-agency conflict which has already curtailed and threatened with extinction the 12-year-old government research program aimed at paving the way to development of a natural rubber industry in Latin America.

This was disclosed in a letter written by Presidential Assistant Gerald D. Morgan to Representative Paul Shafer (Rep., Mich.), and released by the Congressman recently. Mr. Morgan said that the Foreign Operations Administration has reversed its previous stand to stop financing the regional research program, and will continue the program this year on a slightly curtailed basis.

Mr. Shafer applauded the decision and expressed confidence that government researchers, working with Latin American governments, will develop disease-resistant, high-yielding rubber seedlings within another year or two capable of widespread planting in Latin America.

Prepared to Market Butyl

Esso Standard Oil Co. has bid for the government-owned Butyl plant at Baton Rouge, La., and, if successful, will market production through the Enjay Co., Inc. Enjay is the chemical products marketing affiliate of the Standard Oil Co. (New Jersey). Humble Oil & Refining Co. has indicated similar plans for marketing a substantial quantity of Butyl rubber if it acquires the government Butyl plant at Baytown, Texas. To handle the servicing of Butyl and Vistanex sales, a rubber division of Enjay is being formed under A. Bruce Boehm, vice-president. Walter H. Peterson, who has long experience in the rubber field, is assisting Mr. Boehm in this work. In support of the sales organization plans, Dr. M. W. Swaney, director of the Enjay Laboratories Division of the Standard Oil Development Co., is preparing to give technical assistance on the use of Butyl. Mr. Peterson has been associated with Enjay marketing activities for the past ten years. Prior to World War II, he was with Haartz-Mason, and in 1942 joined the Synthetic Rubber Allocation Section, War Production Board, which section he later headed. He is presently on part-time loan to the Office of Synthetic Rubber as a technical consultant on Butyl. Howard R. Moon, associated with the B. F. Goodrich Co. before joining Enjay in 1947, has been assigned to the new division. Heading up the Rubber Section of Enjay Laboratories is Harold J. Rose, assisted by J. L. Ernst, both of whom have extensive background in Butyl technology. A new service laboratory is now under construction at the Research Center in Linden, N. J.

Forming Texas Butadiene Plant

Formation of the Texas Butadiene and Chemical Corp., for the purpose of developing plans for the construction of a combination butadiene and alkylation plant in the Gulf Coast area, has been announced. Participants in the company include: Wm. R. Staats & Co., Los Angeles, Calif.; Wetheim & Co., New York, N. Y.; Carl M. Loeb, Rhoades & Co., also of New York; Warren Petroleum Corp., Tulsa, Okla., and the Fluor Corp., Ltd., Los Angeles. The prospective plant will utilize butane as the principal raw material and will use the Houdry process for the production of butylenes and butadiene with the Phillips Furfural process being used for purification. Dr. Robert L. Purvin, Dallas, Texas, has been named president.

GOODRICH PLANNING PURCHASE OF SPONGE RUBBER PRODUCTS CO.

The forthcoming purchase of the assets and business of the Sponge Rubber Products Co. by the B. F. Goodrich Co. has been announced by John L. Collyer, chairman of the board of B. F. Goodrich, and Frederick M. Daley, president and co-founder of Sponge Rubber Products. The purchase will be by the payment of Goodrich common stock for the assets and goodwill of the business, according to the joint announcement. The sale has been approved by the directors of Sponge Rubber Products and was to have been submitted to stockholders for approval late in July.

Sponge Rubber Products was formed in 1923 by Mr. Daley and William R. Todd, now vice-president and treasurer of the company. Both of these officers and other executives and personnel will continue in their present positions under Goodrich ownership. Under the new ownership, Sponge Rubber Products will be operated as a division of Goodrich.

Sponge Rubber Products is engaged in the manufacture and sale of chemically-blown cellular rubber products of natural and synthetic rubber, latex foam and expanded plastics. These include molded sponge products, continuous sponge sheets, rug underlay, strips and rods, foam pillows, furniture cushions, automotive toppers, mattresses, rubberized hair cushioning, and expanded plastic flotation and insulation materials. The company also manufactures pressure switches for jet engines.

Sponge Rubber Products, a leading producer and the pioneer in its field, operates plants at Shelton and Derby, Conn., Fall River, Mass., and has a Canadian subsidiary at Waterville, Quebec.

Forms Resins Sales Group

Formation of a specialized resins sales group to expand both surface coating and structural applications of "Epon" resins has been announced by the Shell Chemical Corp., New York, N. Y. Five senior technical sales representatives are the initial members of the new sales group. They recently completed an intensive six-week training program at the company's laboratory at Union, N. J. Enlargement of the group is planned to coincide with further expansion of the market for Shell Chemical's Epon series of epoxy resins. The new sales group program puts into the field technical sales personnel who are up-to-date on the latest developments and applications of Epon resins. The five appointees to the new group are: R. L. Hallam, Detroit; C. F. Herot, Cleveland; W. A. Hubbard, Chicago; G. F. Metzinger, Newark, N. J.; and D. M. Neely, N. Y.

Moves New York Office

In keeping with its current expansion, and to better serve its customers, the offices of the Columbia-Southern Chemical Corp. have been moved from 30 Rockefeller Plaza to 579 Fifth Avenue, New York 17, N. Y. The new telephone number is Murray Hill 8-8350. The new office facilities take the entire tenth floor at 579 Fifth Avenue.

GOODYEAR NAMES THREE TO CHEMICAL DIVISION SALES SERVICE SECTION

J. F. Carraher

E. C. Brown, Jr.

E. Scott

Three new appointments at the headquarters of the Chemical Division of the Goodyear Tire & Rubber Co. at Akron, Ohio, were recently announced. Taking on the new assignments, all in the Sales Service Section, are James F. Carraher, Edward C. Brown, Jr., and Earl Scott. Mr. Carraher, a chemical engineering graduate from Case Institute of Technology, has been assigned to the newly-created position of servicing the greatly expanding vinyl processing industry by providing technical and engineering service on Pliovic vinyl resins. Mr. Brown, a graduate of Montana State College, will service the plastic molding industry by providing technical assistance in the use and application of "Plio-Tuf", Goodyear's high impact thermoplastic molding resin. Mr. Scott, an alumnus of the University of Wisconsin, with ten years of experience in research and development of coatings, will handle technical sales service on "Chemigum", "Pliolite" and "Pliovic" latices principally for the textile and paper industries.

Forms New Training Section

E. I. du Pont de Nemours & Co., Inc., has announced the establishment of a new Organic Chemicals Department sales training Section under Emory D. Fanning. William A. Bours, III, has been appointed assistant sales director of the Kinetic Chemicals Division succeeding Mr. Fanning. Francis L. Shackelford, Jr., for the past year assistant sales development manager for the Rubber Chemicals Division, has been named chemical sales manager of the Dyes and Chemicals Division, replacing Mr. Bours. Mr. Fanning joined the company in 1929. In his new position, he will be responsible for training new sales personnel and refresher training for salesmen of the Organic Chemicals Department's four divisions—Petroleum Chemicals, Rubber Chemicals, Kinetic Chemicals, and Dyes and Chemicals.

Dewey & Almy Appoints Lowry

Dewey & Almy Chemical Co., Cambridge, Mass., has announced the appointment of Robert D. Lowry as technical director of its Cryovac Division. The post is a newly-created one in the division, which manufactures and markets plastic bags and equipment for use in the Cryovac process for packaging meat, poultry and cheese. From 1931 to 1948 Mr. Lowry was engaged in research and development activities for Dow Chemical Co., Midland, Mich., in the chemical, magnesium and plastics fields and was director of the Saran development laboratory when he left in 1948 to become manager of Dewey & Almy's Cryovac plant at Lockport, New York.

Appointed Staff Assistant

Verner Alexanderson has been appointed staff assistant to the technical director for intermediates and rubber chemicals at the Bound Brook, N. J., plant of the American Cyanamid Co. Mr. Alexanderson joined American Cyanamid in 1939 at the company's plant in Linden, N. J. He was transferred to Cyanamid's offices in New York City where he was an engineer in the technical department from 1940 until 1945 when he was appointed a project engineer in the Central Engineering Department. In 1951, Mr. Alexanderson became a supervisor in the Priorities and Allocations Department and in 1952 he was assigned to the company's Washington office. In 1953 he was assigned to the Market Research Department as a senior market analyst, a post he held until his present assignment. He was graduated from Amherst College in 1938 and attended the Harvard Graduate School of Business Administration.

Develops New Silastic 132

Dow Corning Corp., Midland, Mich., has developed an improved silicone rubber coating for glass cloth or synthetic fabrics. Retaining the name, price and basic properties of "Silastic 132," which it replaces, the new material features greatly increased crease resistance and excellent retention of dielectric strength. Less sensitive to processing temperatures than comparable silicone rubbers, the new Silastic 132 cures equally well over a wide range of lower temperatures. It is commercially available in the form of 100% solids or as a 35% dispersion in xylene.

PROPOSES REVISED STANDARD FOR RETREADING AUTO TIRES

A special committee representing the Tire Accessories and Repair Materials Committee of the Rubber Manufacturers Association, New York, N. Y., conferred in Washington on July 21 with representatives of the U. S. Department of Commerce and the National Association of Independent Tire Dealers, Inc., concerning proposed revision of the Department's Commercial Standard CS-108-43 relating to treading automobile and truck tires.

This special committee emphasized that although camelback manufacturers favor any constructive endeavor to improve the practices of retreaders, they are certain the proposed revision of this Commercial Standard will not accomplish this. In fact, camelback manufacturers are convinced the proposed revision will be misrepresented to and misconstrued by the purchasing public. It will boomerang upon the reputable retreader because his unethical competitor is not effectively prevented from claiming that his poor quality product complies with the Government-sponsored Commercial Standard and is equal to the genuine high quality product of the reputable retreader, RMA stated.

The proposed revised Commercial Standard makes no provision for enforcement of policing, or even for controlling use of the label or medallion it is proposed to utilize for informing the purchasing public that the retreaded product complies with the Government's Commercial Standard.

Quality Guaranty Difficult

The camelback manufacturers' representatives pointed out that it is impossible to guarantee high quality through any standard or specification of this sort, detailing compounding or formulation requirements for either camelback or repair materials.

Any compound formulation requirement that can be devised will permit such wide variation in quality that neither the public nor the retreader has any assurance of high quality. What is today a proper admixture of raw materials to produce a quality product may be obsolete tomorrow. Competition in the rubber manufacturing industry compels constant product improvement, which involves unremitting research and continuous development, resulting in new raw materials requiring formula changes. Attempting to control compound formulations through Government standards offers no protection to the consumer, but does stifle development progress which penalizes both the quality manufacturer and the consumer.

The lack of practical and effective means of field inspection or policing of compound requirements makes them useless as a quality guaranty, even if it were possible to keep them up-to-date through frequent changes reflecting latest development. Therefore, camelback manufacturers suggested no responsible Government agency or member of the Industry should sponsor or endorse the use of compound formulas to assure quality.

The camelback group endorsed the continuance of educational material and special activities which heretofore have been made available to retreaders by individual manufacturers, by the Rubber Manufacturers Association and by the National Association of Independent Tire Dealers.

In practical application it is not possible to uniformalize shop practice. In the final analysis, the determining factor in the processing of each individual tire is the retreader's skill and "know-how" acquired through experience. The special committee could see no reason why the Government should duplicate either the existing educational material relating to shop practice, or the expense involved in printing and distributing to retreaders throughout the country, in the form of a Commercial Standard, what would simply be another description of recommended good shop practice.

GOODYEAR CONSTRUCTS WORKING MODEL OF RIVERLAKE BELT CONVEYOR

A working model in miniature of the Riverlake Belt Conveyor Lines System, that will transport coal and iron ore between Lake Erie and the Ohio River, has been constructed by the Goodyear Tire & Rubber Co. Containing 6,776 working parts, the Riverlake model will be installed in a specially-built trailer with glass sides and shown throughout the state of Ohio. The model's moving belts transport miniature coal in one direction and "make-believe" iron ore in the other from the waterfront terminals. The central section depicts the elevated two-way main line structure in the open country as it crosses Ohio by way of Youngstown. Coal is conveyed from barges on the river onto the main line belt and storage bins at the lake terminus. Ore is moved in the opposite direction from lake front stock piles, and as the ore carriers and river barges are unloaded they are filled with the materials being received off the conveyor belt system. Two scale transfer points route the coal and ore on and off the main line belts from stockpiles and storage bins. Goodyear states that the model required six months to build. Riverlake officials recently announced that legislation to give belt conveyor transportation the status of a common carrier will be introduced in the Ohio Legislature again in 1955. The Legislature recently approved a plan to move coal from Ohio mines to Cleveland.

Receives Small Business Loan

According to a recent report from the Small Business Administration, Washington, D. C., the Southeastern Products Corp. and the Southeastern Rubber Products Corp. of Birmingham, Ala., have received a loan of $115,000 for the manufacture and sale of molded rubber goods. This was a direct loan as opposed to a bank participation loan.

Schwarz Named to New Post

George W. Schwarz, vice-president and treasurer of the Wyandotte Chemicals Corp., Wyandotte, Mich., has been appointed vice-president in charge of a group of Wyandotte operating and staff activities embracing all purchasing, transportation and traffic functions and non-chemical product sales. Ford Ballantyne, Sr., vice-president and secretary, has been elected secretary in addition to his other duties. Grouped under Mr. Schwarz in his new capacity will be the Purchasing Department headed by Harry R. Wurster, who becomes director of purchases; the Traffic Department headed by William S. Nevius, director of traffic; non-chemical and by-product sales; and executive supervision over the Wyandotte Transportation Co., which operates a fleet of lake ships and barges; Ford Collieries, a coal mining subsidiary; and liaison with Wyandotte Terminal Railroad, an independent carrier servicing the Wyandotte and other downriver industrial plants. Mr. Schwarz is active nationally in affairs of the Controllers Institute of America. He is now chairman of its board of directors, having just served a year as president of the national organization.

PRECISION extrusion

FAST extrusion

get them both with

STATEX®·M

Even where feather edges are required, the carefully controlled surface structure of STATEX-M will make it easier to maintain production at a profit-making pace.

COLUMBIAN CARBON COMPANY

• A COLUMBIAN COLLOID •

500 TONS OF SMOKE A DAY

COLUMBIAN CARBON CO. · BINNEY & SMITH INC.

MANUFACTURER — DISTRIBUTOR

SAF (Super Abrasion Furnace)

STATEX®-125

◆

HAF (High Abrasion Furnace)

STATEX-R

◆

MPC (Medium Processing Channel)

STANDARD MICRONEX®

◆

EPC (Easy Processing Channel)

MICRONEX W-6

◆

FF (Fine Furnace)

STATEX-B

◆

FEF (Fast Extruding Furnace)

STATEX-M

◆

HMF (High Modulus Furnace)

STATEX-93

◆

SRF (Semi-Reinforcing Furnace)

FURNEX®

COLUMBIAN CARBON CO. • **BINNEY & SMITH INC.**

MANUFACTURER DISTRIBUTOR

SECOND QUALITY CONFERENCE SCHEDULED FOR NEW YORK CITY

According to the Rubber Manufacturers Association, Inc., arrangements are going forward to set up in New York next April or May a second international conference on "Natural Rubber Packing and Quality." A number of the Far Eastern and European producing, packing, shipping and consumer organizations represented at the initial conference in Singapore last April have cabled their intent to send delegates. Sixty-nine delegates representing 21 associations in eight countries attended the Singapore meeting.

The Rubber Manufacturers Association and the Rubber Trade Association of New York, joint hosts at the second quality parley, had originally proposed setting up the conference this fall. The meeting has been set forward until the early spring of 1955 in deference to the wishes and convenience of many delegates who will be attending from the Far East.

In addition to the conference, which is expected to require about three days, many visitors are expected to take side trips which will give them an opportunity to view the condition of incoming rubber at the U. S. dockside and as it is received at manufacturing plants. Visits to U. S. synthetic rubber producing facilities which by that time may well be in private hands, are also a possibility.

RMA and RTA officials have expressed confidence that in affording representatives of producing, packing and shipping interests an opportunity to view the quality and condition of U. S. arrivals, the New York conference will give the visitors a better understanding of the problems which have long beset both U. S. organizations.

Feeling of both the RMA Crude Rubber Committee and the Crude Rubber Committee of the RTA of New York that the Singapore conference had most beneficial results is reflected in the minutes of a joint meeting of those committees in New York on June 30. Those minutes said:

"The RMA Chairman reported that his committee believed the results of the Singapore Conference far surpassed anything that had been anticipated. It felt the conference worthwhile and that it had generated a better understanding of the mutual problems faced by consumers, producers and the trade, and it enthusiastically endorsed the desirability of having a second conference in New York.

"The President of the RTA of New York and the Chairman of the RTA Crude Rubber Committee stated that they also believed the Singapore Conference to have been beneficial and successful."

Introduces p-Chlorothiophenol

Evans Chemetics, Inc., New York 17, N. Y., has announced the availability of p-chlorothiophenol, which may be used to prepare mixed disulfides. With a molecular weight of 144.61, products obtained from the reaction of p-chlorothiophenol with the various phosphorous and sulfur chlorides and oxychlorides are expected to have possibilities as plasticizers, stabilizers and oil additives.

Elected Continental President

Dr. Walter H. Grote

Dr. Walter H. Grote, widely-known in the rubber industry in the United States and Europe, has been elected president of the Continental Machinery Co., Inc., New York, N. Y. Dr. Grote succeeds the late Harry J. Smith. Beginning his career in the rubber industry with the U. S. Rubber Co. in 1913, Dr. Grote has also been associated with the former Murray Rubber Co. of Trenton, N. J., where he served as chief chemist. He has also been associated in various sales capacities with the United Carbon Co., Wilmington Chemical Co., and the Phillips Chemical Co. Most recently, he has served in a consulting capacity with Brown & Blauvelt, engineers specializing in the construction of rubber, chemicals and explosives plants. Under Dr. Grote's direction, Continental Machinery will broaden the scope of company activities. In addition to complete factory installations in the United States and abroad, the company will shortly introduce automatic rubber-working equipment of original design. The company will also represent a select group of European suppliers in the United States. Continental Machinery will maintain its headquarters at 261 Broadway, New York 7, N. Y.

Opens New Wollastonite Mill

Godfrey L. Cabot, Inc., Boston, Mass., has announced the opening and operation of a new $1,790,000 mill at Willsboro, N. Y., by the Cabot Minerals Division of the Cabot Carbon Co., for the annual production of 60,000 tons of Wollastonite. Wollastonite was first introduced to industry in commercial quantities by Cabot in 1952. Ground to varying degrees of fineness, it is being offered in a variety of grades for use by the paint, ceramics, plastics and welding rod coating industries. It is also being used in the manufacture of low cost di-electrics and in other new applications constantly being developed by research and sales activities. The new plant is modernly equipped for 100% mechanical handling and processing and can be easily expanded to meet increased production requirements. It is located on a level site bordering Lake Champlain, about two and one-half miles west of the town of Willsboro.

STRIKE HITS GOODYEAR PLANTS; WAGE NEGOTIATIONS CONTINUE

Approximately 23,000 members of the United Rubber Workers, C.I.O., went on strike on July 8 at the ten plants of the Goodyear Tire & Rubber Co. Production stopped, but office workers were permitted to pass through the picket lines. At this writing, the strike is still in progress with no agreement reported. While the union has not made public its demands, it is reported that in the Goodyear negotiations it has requested a 7½ cent an hour wage boost plus an additional 5¼ cents an hour to correct inter- and intra-plant inequities.

It was also reported that similar demands were made on other companies, including the U. S. Rubber Co. The Policy Committee of URW had called a strike at U. S. Rubber plants for July 20, but decided to continue working on a day-to-day basis while negotiations are in progress.

Work also continued on a day-to-day basis at plants of the B. F. Goodrich Co. The Goodrich contract with the union expired on July 26. J. W. Childs, vice-president of URW, who is directing the union bargaining group in the Goodrich talks, stated that, "All the factories involved are in a position to be struck if a wage settlement is not forthcoming soon."

URW is also continuing bargaining sessions with the Firestone Tire & Rubber Co. and the General Tire & Rubber Co. In the case of Firestone, URW has set the date of August 10 as a sign-or-strike deadline. The industry is said to have offered the union a wage increase of 5c an hour. The union has rejected this offer as "inadequate and sub-standard."

L. S. Buckmaster, president of the URW, declared that the strike at Goodyear was "caused by the refusal of Goodyear to grant an adequate wage increase and to make substantial correction of wage differentials in their low paid plants."

A guaranteed annual wage demand, one of the points in URW talks with industry earlier this year, was dropped during current negotiations when Goodyear argued that, under the present contract, only wages were open for discussion.

A Goodyear spokesman also stated that the five cents an hour offer was "the same as that recently accepted by the C.I.O. United Steelworkers of America, and also agreed to by many unions in the electrical industry.

Cordura Sales Manager Named

The appointment of Howard P. Brokaw as sales manager for "Cordura" high tenacity rayon has been announced by the Textile Fibers Department of E. I. du Pont de Nemours & Co., Inc. Mr. Brokaw succeeds Charles E. du Pont, who has left the company. Prior to his appointment, Mr. Brokaw was supervisor of the Customer Service Section of the Textile Fiber Department. Mr. Brokaw joined DuPont in 1939 as a chemist in the Organic Chemicals Department. He joined the Textile Fibers Department in 1949 as a textile engineer for acetate sales and since that time has been associated with various responsibilities in the sales of rayon and Orlon acrylic fiber as well as acetate.

TLARGI RUBBER TECHNOLOGY LABORATORY PUTS BANBURY IN OPERATION

The Rubber Technology Laboratory at the University of Southern California, Los Angeles, Calif., took another step forward during the month of March when Dr. Fernley H. Banbury, inventor of the Banbury Mixer, put into operation the new Banbury Mixer donated by the Farrel-Birmingham Co., Inc., Ansonia, Conn. Dr. Banbury acts as consultant to Farrel-Birmingham. The Rubber Technology Foundation is sponsored by the Los Angeles Rubber Group, Inc.

The first batch of material in the mixer was run by Dr. Banbury for the instruction and information of the advanced rubber technology laboratory class in session on the evening of March 8. Discussion and demonstration of the machine by a man so intimately connected with its development and use was a rare experience for the students and practical rubber men taking the course.

The Banbury Mixer itself is the most complete piece of equipment of its kind. It is a size "B" laboratory model built to run three-four pounds of stock and incorporates all the latest improvements used on the largest Banburys, those capable of producing 1,200 pound batches. The laboratory at U.S.C. now houses, in addition to the Banbury, a 13-inch laboratory open mill, a four-roll laboratory calender (both produced by Farrel-Birmingham), an Atlas Weather-Ometer, 2 Preco presses and numerous pieces of testing equipment.

To date, $65,000 has been spent to make the laboratory one of the most complete of its kind. It is housed in two buildings, the testing laboratory being on the second floor of the Chemical Engineering Building at U.S.C., and the heavier pieces of compounding equipment being located in a separate one-story structure devoted entirely to that purpose.

Some indication of the academic as well as practical value of the courses offered by the Foundation is given by the number and types of individuals attending the classes. During the short period since the Foundation's classes were started under the guidance of Dr. Harry L. Fisher, those enrolled in the classes have included students from U.S.C. without practical experience, technicians from the rubber industry without academic background, students working toward their Master's and Doctor's degrees, graduate chemists with years of experience in the rubber industry, and owners and general managers of well-known rubber companies in the area.

The five accredited courses and one non-credit course now offered have been tailored to meet the requirements of those looking forward to work in or already working in the rubber industry.

Basic Rubber Technology I, a non-credit course covering practical technological work, meets for three hours each Thursday evening under the direction of John L. Ryan. This semester's class has an enrollment of 26 students. The material covered is that of practical interest to those up to the foreman level in the rubber industry and covers basic rubber information of particular value to those contemplating sales work in the rubber field.

Rubber Technology II, an accredited course No. 442 in Chemical Engineering, meets for two hours each Wednesday evening. It is a two unit course under the direction of Dr. Fisher. Eleven students, all with graduate degrees and now in the rubber industry, are enrolled. The course covers the study of natural and synthetic rubbers, their preparation, chemistry, vulcanization, acceleration, antioxidation, bonding, compounding, the study of Latex, and the chemical derivatives of natural rubber.

Rubber Technology III, Chemical Engineering Course No. 528, is a three unit course, meeting for three hours each Thursday evening under the direction of Dr. Fisher. It goes more extensively into the subjects covered in Course 442 and emphasizes seminar work.

The students are assigned recently published articles which they study and present to the rest of the group. There are five graduate students enrolled in this class.

Advanced Rubber Technology Laboratory, Chemical Engineering Course 490b, is a two unit course meeting Monday evenings, at which time there is one hour of lecture and three hours of laboratory work, under the direction of Dr. Fisher and Joseph B. Larkin. Ten undergraduate and graduate students are enrolled.

Work done by the students in the laboratory includes the compounding, preparation and curing of natural and synthetic rubber stocks. A variety of tests are run on the most modern of testing equipment. Aging is done by the oven, oxygen bomb, test tube, and weather method. Gehman, Bent Loop and T-50 cold tests are run. Resilience is tested by the Yearzley Oscillograph, plasticity by the Williams Plastometer. Tensile strengths, specific gravities, durometer, and compression set are tested. The course is gauged to the level of the man inexperienced in actual laboratory work, and at the same time is so complete in the use of the most modern types of equipment that it holds great value for the most experienced laboratory technicians.

Rubber Technology Research Courses No. 590L and 590Mb provide credit of two units and one unit respectively for research work now being done by graduate student Richard P. Fiedler, who is working in the Foundation's laboratory under the guidance of Dr. Fisher on the preparation of a possible new synthetic rubber. These two research courses cover a full day's work each Thursday.

Credit toward a Master's degree can be obtained by the preparation of a thesis under the supervision of the Rubber Technology Foundation. Raymond Chikahisa last semester gained one credit toward his Master's degree with his thesis on Hypalon.

The first two years of operation under the TLARGI Rubber Technology Foundation have been devoted to putting in order the finest rubber laboratory facilities available and tailoring the instruction to the academic and practical needs of the rubber industry. It is expected that the laboratory will be expanded further as time goes on to meet additional requirements for trained personnel.

Front view of the TLARGI Rubber Technology Foundation Laboratory. Left to right: R. E. Vivian, dean of the School of Engineering; Charles M. Churchill; Harry L. Fisher, director of the Foundation, and R. D. Abbott. Both Mr. Abbott and Mr. Churchill are members of the Education Committee of the Los Angeles Rubber Group, which made the Foundation possible.

Sun Rubber has introduced a new toy modeled after Donald Duck's three nephews, "Huey," "Louie," and "Dewey." The three vinyl figures appear in a tub of the same material and the entire toy doubles as a bath or beach toy.

CHICAGO RUBBER GROUP HOLDS GALA GOLF OUTING ON JULY 23

Approximately 325 members and guests of the Chicago Rubber Group attended the Golf Outing held on July 23 at the St. Andrews Country Club, West Chicago, Ill. The outing featured a full schedule of golfing events and the serving of a dinner. James Dunne (C. P. Hall) served as chairman of the Outing Committee with Ralph Anschuetz (Witco Chemical) as assistant chairman. Members and guests winning prizes follow:

Low Gross (members)—Don Zimmerman (U. S. Rubber); Jim Adams (Sears, Roebuck); Charles Skuza (Phoenix Mfg.); M. Leonard (Binney & Smith); Russ Kurtz (DuPont); George Smith (Williams-Bowman Rubber). *High Gross* (member)—R. Hoatman (American Can). *Low Gross* (guests)—Harold Peters; Mr. Cox; Mr. White. *Long Drive* (member)—R. L. Sullivan, Jr. (Reliable Rubber). *Long Drive* (guest)—C. Oshinski (U. S. Rubber).

Nearest to Pin (member)—Al Laurence (Phillips Chemical). *Nearest to Pin* (guest)—Tom Bieterman. *Putting Green* (member and guest)—I. E. Meyer (Herron & Meyer); M. Miller (Armstrong Rubber); T. R. Hough (Central Solvents). *Putting on Course* (members)—Frank Travers (Waukesha); Bill Johnson (Goshen Rubber); W. Bolling (Anderson-Bolling). *Duffer Prize* (member)—W. Kohler (Precision Scientific). *Putting on Course* (guest)—S. Cyrd; Bill Roche; G. McCarthy.

Blind Bogey (members and guests)—George Smith (Williams-Bowman Rubber); H. Calberg; Mr. Anderson; Bruce Hubbard (Ideal Roller); R. Hough (Central Solvents); F. Harper (Williams-Bowman Rubber); Phil Manchester (Linde Air Products); Mr. McCoy; R. Oncken (Central Rubber); I. Grau. *Most Improved Golfer* (member)—B. Nilles.

Peoria Handicap (members)—H. Boxser (Acadia Synthetic Products); E. Altman (Altman Mfg.); E. Meier (Colonial Rubber); A. Robinson (Harwick-Standard); W. Wilson (R. T. Vanderbilt); Mr. Luedke; Mr. Nesslock; D. M. Bliss (American Rubber Products); Joe Nieberding (Phoenix Mfg.). *Peoria Handicap* (guests)—Mr. Roop; Mr. Fowler; Mr. Nadherny.

For members and guests who did not participate in the golf tournament, there were other games and sporting events. The following members and guests won prizes in the games noted:

Horseshoes—O. G. Popp (Phillips Chemical); D. J. Ball (American Container); Mr. Carlson (Bauer & Black). *Darts*—C. Dominik (Hood Rubber); B. Volkner (Hood Rubber); Mr. Millop (U. S. Rubber.) *Baseball Throw*—Jack Scanlan (Pure Carbonic); Mr. Nadherry (Godfrey L. Cabot); Wayne Place (Jasper Rubber).

A new 4-page booklet, containing a list of 40 dispersions of colloidal graphite, molybdenum disulfide, vermiculite, and zinc oxide, has been issued by the Acheson Colloids Co., Port Huron, Mich.

Coming Events in the Rubber Industry

Aug. 20. Philadelphia Rubber Group, Golf Party and Outing, Cedarbrook Country Club, Mount Airy, Philadelphia, Penna.

Sept. 15-17. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

Sept. 16-20. Scrap Rubber & Plastics Institute, National Association of Waste Material Dealers, Inc., Sagamore Hotel, Bolton Landing, N. Y.

Sept. 23. Southern Ohio Rubber Group, Fall Technical Meeting.

Sept. 25. Connecticut Rubber Group, Annual Outing, Grassy Hill Park, Sodom Lane, Derby, Conn.

Sept. 30. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Oct. 5. Buffalo Rubber Group, Westbrook Hotel, Buffalo, N. Y.

Oct. 5. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Oct. 8. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Oct. 14. Northern California Rubber Group.

Oct. 15. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 22. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Nov. 3. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Nov. 11. Northern California Rubber Group.

Nov. 12. Philadelphia Rubber Group, Dinner Meeting, Poor Richard Club, Philadelphia, Penna.

Nov. 17. Washington Rubber Group.

Nov. 18. Rhode Island Rubber Club, Fall Meeting, Metacomet Golf Club, East Providence, R. I.

Dec. 2. Fort Wayne Rubber and Plastics Group.

Dec. 3. Los Angeles Rubber Group, Xmas Party, Ambassador Hotel, Los Angeles, Calif.

Dec. 8. Buffalo Rubber Group, Xmas Party, Buffalo Trap and Field Club, Williamsville, N. Y.

Dec. 9. Northern California Rubber Group.

Dec. 10. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 10. Detroit Rubber & Plastics Group, Xmas Party, Sheraton Cadillac Hotel, Detroit, Mich.

Dec. 10. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 17. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Dec. 18. Southern Ohio Rubber Group, Xmas Party.

Non-Tarnishing Gold Pastes

Claremont Pigment Dispersion Corp., Brooklyn, N. Y., is producing two non-tarnishing gold pastes designed to enable fabricators of calendered, molded and extruded vinyl to manufacture gold-colored products exhibiting a stability to processing temperatures and light exposure heretofore unobtainable with conventional gold colorants. The company states that excellent results have been achieved using "Palegold Paste, Code D-731" and "Richgold Paste, Code D-775" in a variety of commercial vinyl compounds and under a wide range of temperatures. Gold vinyl compounds pigmented with the company's non-tarnishing gold pastes are said to show no breakdown or discoloration when exposed to heat of 350°F. for one hour. Claremont also reports no color break after exposure under standard Fadeometer conditions for 400 hours.

Take a long time for this copy of RUBBER AGE to reach your desk? Use the coupon on page 759.

Gulf Making Iso-Octyl Alcohol

Gulf Oil Corp., Pittsburgh, Penna., is now producing iso-octyl alcohol in its new plant at Port Arthur, Texas, and has begun to ship tank cars of the product. Having a production capacity of about 9,000,000 pounds of iso-octyl per year, the new plant was designed to allow for a high degree of product flexibility. Besides iso-octyl, the plant is capable of producing nonyl, decyl, tridecyl, and other alcohols. The Port Arthur plant is Gulf Oil's first venture into the general organic chemical market.

Firestone Receives NSC Award

Firestone Tire & Rubber Co., Akron, Ohio, has received the National Safety Council's Public Interest Award for "exceptional service" to public safety education through its radio and television program, the "Voice of Firestone." The Council cited the various efforts of the company—such as talks, skits, and support of highway safety and National Farm Safety Week—to promote public safety.

ADDITIONAL TECHNICAL PUBLICATIONS OF BRPRA MADE AVAILABLE

Abstracts of some of the recent publications issued by the British Rubber Producers' Research Association are published from time to time in RUBBER AGE. These booklets, which cover research work conducted by various members of the BRPRA staff, may be secured by writing the Association at 19 Fenchurch Street, London E.C. 3, England. Abstracts of some of the more recent publications follow:

The Velocity and Temperature Dependence of Rubber Friction, by A. Schallamach. (Publication No. 179): It is shown experimentally that the velocity of frictional gliding under constant tangential stress of rubber on glass and on silicon carbide cloth is, in the first approximation, an exponential function of the reciprocal absolute temperature and of the tangential stress. It is suggested that frictional gliding of rubber is a rate process.

Hydroperoxide Decomposition in Relation to the Initiation of Radical Chain Reactions, by L. Bateman, (Mrs.) Hilda Hughes and A. L. Morris. (Publication No. 180): Two aspects of the catalysis of liquid phase olefinic autoxidations are discussed: (1) hydroperoxide catalysis at concentrations $< ca.$ 0.02 M; (2) the relationship between the kinetic form of the initiating process at hydroperoxide concentrations $> ca.$ 0.02 M and the mechanism of hydroperoxide decomposition *in vacuo*. The principal conclusions are respectively: (1) in the very early stages of the reaction, the rate of oxidation $\propto [RO_2H]^{1/2}$, implying the initial generation of free radicals by a first-order process, which is subsequently replaced by a second-order process in the concentration region where the usually observed proportionality to $[RO_2H]$ prevails; (2) the kinetics of the thermal decomposition of a typical alkenyl hydroperoxide at > 0.02 M are consistent only with a second-order primary radical-producing reaction, in agreement with the kinetic requirements of its catalytic behavior.

The Electronic Spectra of Conjugated Hydrocarbons, by W. Moffitt. (Publication No. 181): A new method for dealing with problems of electronic structure, which has been successfully applied to the ethylene molecule, is adapted to the general treatment of conjugated hydrocarbons. Since the theory underlying this method may be closely related to the method of antisymmetrized molecular orbitals, a fairly exhaustive discussion of this representation is included in the paper. It is shown how the relevant energy matrices may be assessed without too much labor and, in a final section, the theory is followed numerically, though somewhat approximately, for the simplest case of conjugation which is encountered in the allyl radical.

Some Calculations on the Ethylene Molecule, by W. Moffitt and J. Scanlan. (Publication No. 182): A new treatment of the structure of both planar and twisted forms of ethylene is given. Attention is focused on the unsaturation electrons, to which the method of atoms in molecules is applied. Values are calculated for the location of the $N \rightarrow V$ absorption bands, which are in good agreement with the observed spectrum. The twisting frequency is also estimated. The results obtained are uniformly better than those of previous calculations.

Degradation of Natural Rubber in Solution *in Vacuo*, by W. F. Watson. (Publication No. 183): Rubber in solution degrades in the absence of oxygen. This non-oxidative degradation is the main cause of the decrease in viscosity of rubber solutions on storage. The rate of degradation is proportional to the rubber concentration and is independent of the purity and molecular weight of the rubber initially. The energy of activation for degradation in chlorobenzene is 15.9 ± 0.5 k.cal. The rate of reaction is not influenced by different non-polar solvents for rubber, but is accelerated by acids. These results suggest that rubber polymer possesses one anomalous bond per 1.3×10^4 monomer units. Evidence is advanced for this phenomenon being associated with the gelling of solid rubber on storage.

Surface Condition and Electrical Impedance in Rubber Friction, by A. Schallamach. (Publication No. 184): It is shown experimentally, by employing electrically conductive rubber, that during the frictional gliding of rubber a thin layer in contact with the track undergoes a deformation which considerably increases the electrical impedance of this layer. In the case of previously abraded rubber the layer is permanent. If a d.c. potential is applied between sample and track during sliding, electrostatic attraction between sample and track is produced which increases the frictional force. The thickness of the layer, as estimated from the magnitude of the electrostatic force, is a few thousandths of a centimeter.

The Use of Radioactive Sulfur [35_S] in a Study of the Oxidation of *Cyclo*hexyl Methyl Sulfide with *Tert.*-Butyl Hydroperoxide, by G. Ayrey, D. Barnard and C. G. Moore. (Publication No. 185): *Cyclo*hexyl methyl [35_S] sulfoxide has been synthesized from methane [35_S] thiol and has been used to show the irreversibility of the primary oxidation step in the conversion of cyclohexyl methyl sulfide into the corresponding sulfoxide by *tert.*-butyl hydroperoxide.

Non-Destructive Examination of Flat Bonded Rubber Mountings, by D. M. Heughan and D. O. Sproule. (Publication No. 186): The use of bonded rubber mountings has become widespread in many engineering fields. However, some limitations are imposed upon the allowable stresses in designs because of possible bond imperfections from which early failure may result. This report is concerned with the application of ultrasonic techniques to the detection of flaws inside flat bonded rubber mountings. Experiments are described upon flaws at a bond and in the bulk of the rubber itself using transmission of ultrasonic waves.

Non-Linearity in the Dynamic Properties of Vulcanized Rubber Compounds, by W. P. Fletcher and A. N. Gent. (Publication No. 187): Measurements are described of the dynamic properties of rubber loaded with various amounts and types of filler, when subjected to mechanical vibration in simple shear at amplitudes from 0 to 3 per cent shear in the frequency range 20 to 120 c.p.s. The decrease of dynamic modulus with increasing amplitude is shown for a wide range of filler types and concentrations to be determined by the amount of stiffening produced by the filler. This relationship is not influenced by variations in the vulcanizing ingredients, reasonable variations in state of vulcanization, addition of softener or imposition of static shear strain. Rubber compounds stiffened by mixture with or chemical combination of other polymers exhibit a smaller order of non-linearity than that described above and also exhibit much lower hysteresis values within the amplitude range 0 to 3 per cent shear.

The Autoxidation of 2:6-Dimethylhepta-2:5-Diene, by L. Bateman and A. L. Morris. (Publication No. 188): Autoxidation of 2:6-dimethylhepta-2:5-diene proceeds extremely readily and displays kinetic characteristics appreciably different from those of other olefins hitherto examined. This difference is not due to any change in the fundamental mechanism, but arises from the increased importance of R. compared with RO_2. radicals in rate-controlling propagation and termination processes. This in turn stems from two factors: (1) the high reactivity of the olefin in the reaction $RO_2. + RH \rightarrow RO_2H + R.$; and (2) a marked favoring of the cross-termination reaction $R. + RO_2.$ ($\phi = 6.5$). Attention is directed to the importance of recognizing this behavior in these and analogous oxidations, aldehydes in particular being considered.

New Naugatop Patterns

U. S. Rubber Co., New York, N. Y., has introduced two new patterns in "Naugatop," its plastic topping material that can be applied by the home owner with home tools and hand pressure. The two new patterns are "Grass" and "Pebble." The Grass design is being made in aqua, turquoise, sun-tan, and olive. The Pebble design comes in mist-green, lemon, sand, and charcoal. In addition, Naugatop is also being made in "Linen" and in "Pearl Chip" in four colors. The plastic topping comes with adhesive on its gluing surface and can easily be used to modernize table tops, sink tops, bars, cabinets, dressers, vanities, and other flat surfaces. It can be applied to surfaces of plywood, tempered hard board, or metal. It has a satin finish and can be easily cleaned with a damp cloth. It resists fruit acids, burning cigarettes, alcohol, and boiling water, and is not affected by soaps and greases, the company stated. Naugatop can be bought in 30-inch widths in the length the consumer needs.

DUNLOP TIRE PLANS EXPANSION OF TIRE PRODUCING FACILITIES

According to a recent announcement, the Dunlop Tire and Rubber Corp. plans to make an all-out bid for a major share of the passenger car, truck and bus tire market in the United States. The concern, American subsidiary of England's Dunlop Rubber Co., Ltd., has begun a three-pronged expansion program. Glenn H. Crawford, president of the American concern, and John Lord, finance director and member of the board of the parent company, jointly announced details at a special press conference in New York City on July 24.

The program involves new management, a $5,000,000 modernization of Dunlop Tire and Rubber's tire manufacturing facilities at Buffalo and stepped-up production through the use of new industrial methods.

Mr. Lord said the international Dunlop organization also plans to build new rubber facilities in Canada and Brazil. The parent company claims to be the largest manufacturer of rubber products in the world. It has sixty-one plants, 7,300 sales offices and 93,000 employees.

Changes and improvements in every phase of Dunlop's American tire production facilities will make possible an 80% increase in output, according to Mr. Crawford. He also said the innovations will make for substantial savings in manufacturing costs. The expansion project, Mr. Crawford said, is expected to pay for itself. Further expansion will follow its completion next April, the Dunlop spokesman added.

Mr. Crawford said that among the principal new machines to be installed in Buffalo were more than thirty push-button automation presses used for tire curing. The modernization plants include a program for bringing successive tire-making operation closer together to eliminate costly material handling.

While there are no plans for expanding the advertising program for the company, Mr. Crawford said the American subsidiary of Dunlop intends to tighten up its merchandising operation and is revamping the dealer organization comprising some 5,000 outlets and more than forty warehouses.

One of the products affected by the expansion program is foam rubber, Mr. Crawford said, and $2,500,000 is being spent to increase production. The company plans also to step up its output of golf balls, which are now being produced at the rate of 90,000 a week.

Mr. Lord pointed out that the expansion program in Brazil will double the company's output there. The Brazilian company was set up largely with local capital and is an outstanding example of support by large and small investors in a project launched by foreign know-how.

The new Canadian plant being built at Whitby, in Ontario, will double the Canadian output, Mr. Lord said, and will be in production early in 1955. Dunlop is also engaged in a program of expansion in Western Germany, Japan and France, Mr. Lord said.

Speaks on Tire Cord Research

G. D. Mallory, manager of cords and fabrics research at the research laboratory of the Goodyear Tire & Rubber Co., speaking before engineers attending the summer session at the Massachusetts Institute of Technology, told of difficulties overcome in developing the company's triple-tempered airtight tire cord. He revealed that 20 of his top researchers spent five years working out the chemistry and mechanics of the new triple-tempering process which preconditions tire cord through an exclusive process involving tension, temperature and time. The 3-T process, he said, takes different fabrics from various sources with different types of finishes and produces a uniformly treated fabric. Mr. Mallory observed that a tire requires a little cord but a lot of engineering. The engineering deals mainly with concepts and an understanding of the complex nature of the required performance. Best performance involves compromise, and assurance that some obscure defect or characteristics does not cause a weakness that will chafe out the entire structure, the Goodyear executive declared.

Appointed Trendex Sales Agent

C. P. Hall Co. of Illinois has been appointed sales agent for fatty acids produced by the Trendex Division of the Humko Co., Memphis, Tenn. C. P. Hall Co. of Illinois will handle the sale of the fatty acids to rubber companies in 17 states, including Indiana, Michigan, Wisconsin, Minnesota, Missouri, Alabama, Arkansas, Iowa, Kansas, Louisiana, Mississippi, Nebraska, Oklahoma, Tennessee, Texas, Colorado, and Illinois. W. J. O'Connell, vice-president of the Trendex Division, states that the division is now making shipments of fatty acids on disposable fiber pallets. Shipments are made in square-cornered paper bags that permit the stacking of 40 bags on one pallet. Each bag is spot-glued so that it adheres to the next lower bag in the pallet load, thus eliminating shifting of the bags. This system also permits pallet loads to be handled by fork lift trucks, Mr. O'Connell declared.

Announces Fall Rubber Course

The Boston Rubber Group, in cooperation with Northeastern University, Boston, Mass., has announced plans for its Fall semester course in rubber technology. The course will consist of a practical study of compounding and processing of natural and synthetic rubbers. Common compounding ingredients, various elastomers, and basic processing techniques and equipment will all be covered. Some attention will be given to test methods, quality control, etc. The course is designed for beginning compounders, salesmen, purchasing agents, production supervisors, specification writers, university students and others interested in broadening their knowledge of the rubber industry. The course will carry two and one-half semester hours of credit toward a degree. The course will begin on September 22 and run for 17 weeks. There will be two 50-minute sessions on each Wednesday of each week. The cost will be $40 per student, including the application fee, but exclusive of any texts. Additional information can be secured from Alan W. Bryant, Binney & Smith, Inc., 803E Park Square Building, Boston 16, Mass.

Rubber Road Pavement Pellets

Tiny, synthetic rubber pellets, the size of pencil erasers, which can be mixed with asphalt to produce rubber-asphalt road paving, have been developed by the Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn. Because the pellets are unvulcanized, they can be tossed into a mixing mill at an asphalt plant and in 60 seconds will break down and mix evenly with the asphalt. The pellets will eliminate the need to pre-mix rubber and asphalt at chemical plants and then ship the mixture to construction sites. Now pellets can be stores at the asphalt plant and easily added to the mixture when desired. Rubber-asphalt surfaces should now be practicable on even such small surfaces as private driveways and patios, the company states. From 6 to 12 pounds of pellets are added to a ton of asphalt, which covers 13 square yards of road with a 1½-inch layer of asphalt with a rubber content of from 3 to 6%.

Shown above is a night view of the new foam rubber plant recently opened by the U. S. Rubber Co. at Santa Ana, Calif. U. S. Koylon foam automobile and furniture cushions and rug underlay are being produced in the 87,000 square foot plant.

Enters Reinforced Plastics Field

American Hard Rubber Co., New York, N. Y., after months of intensive research and development, is making available high-pressure compression and transfer-molded parts of glass-reinforced plastics. The company states that though the exceptional strength, stability, electrical properties, and corrosion resistance of glass-reinforced polyesters have been widely accepted for some time, most of the work done to date has been in the fields of low pressure preform and hand-layup techniques. These methods are limited to relatively simple shapes with uniform section thickness. High-pressure molding, a relatively recent development, extends the application of glass-reinforced plastics to parts incorporating varying section thickness, complex details and multiple inserts requiring flow of material around the inserts. High-pressure molding of glass-reinforced plastics has been found to require hardened steel mold equipment. These compression or transfer molding processes now offer definite advantages in many large volume runs. The company states that it is in the unique position of offering what is probably the largest and most varied group of high-pressure compression presses in the country today. The process is based upon loading the mold or transfer pot with a measured charge of putty-lie resin-glass compound, forming to shape by closing the press, and then curing under heat and pressure. The compound is a mixture of resin (usually polyester), a catalyst, a filler, and the chopped glass fiber. Cavity pressures in the order of 2,000 psi are required.

Names Division Sales Managers

Appointment of three new division sales managers has been announced by the Dunlop Tire & Rubber Corp., Buffalo, N. Y. These appointments are in line with the company's policy of strengthening its dealer organization throughout the country. Harry F. Horn-Bostel has been appointed sales manager of the Kansas City, Mo., division, where he will have jurisdiction over tire sales in Missouri, Kansas, western Iowa, Nebraska, eastern Colorado and New Mexico. Carl J. Jenkins was appointed sales manager of the Atlanta, Ga., division, and will supervise tire activities in eastern Tennessee, Georgia, South Carolina, Alabama and Florida. Richard D. O'Brien has been appointed sales manager of the Boston, Mass., division, and will have jurisdiction over tire sales operations in the six New England states.

G-E Forms New Division

A new Chemical and Metallurgical Division has been formed at the General Electric Co., in Pittsfield, Mass. The new division includes the former Chemical Division, which will retain its departmental structure, and the Carboloy Department. Robert L. Gibson has been appointed manager of the new division and will headquarter in Pittsfield. The Chemical and Metallurgical Division will consist of five departments: Carboloy, Plastics, Silicone Products, Chemical Materials, and Laminated and Insulating Products.

Enters Reinforced Plastics Field

William E. Wade

William E. Wade, formerly associated with the U. S. Rubber Co., has been appointed technical director of the Hamilton Rubber Manufacturing Corp., Trenton, N. J., succeeding Norman J. Cyphers. Mr. Wade served for nineteen years in the Mechanical Goods Division of U. S. Rubber as a development engineer at the Passaic, N. J., plant. During this time he headed the development of hose and special rubber products. Mr. Wade attended Bates College where he received his B. S. degree in chemistry. He is a member of the New York Rubber Group, the American Chemical Society and the Technical Committee of the Rubber Manufacturers Association.

Signs Titanium Sponge Contract

A contract which will increase the nation's productive capacity of titanium sponge by 1,800 tons a year has been signed with the Dow Chemical Co. of Midland, Mich., according to an announcement by the General Services Administration. Edmund F. Mansure, Administrator of GSA, said the agreement calls for the company to expand capacity of its present titanium facility at Midland so that production will reach 1½ tons per day by January 1, 1956, and 5 tons per day by July of that year. Existing facilities are rated at 600 pounds per day but production has not been continuous due to experimentation. The company used a magnesium reduction process in producing the sponge.

Union Asbestos Purchases Plant

Union Asbestos and Rubber Co., Chicago, Ill., has purchased a plant at Tyler, Texas, for the production of insulation in the medium and high temperature fields. The new plant at Tyler replaces a plant at McGregor, Texas, which has been taken over by the government for defense needs.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 759.

FFC Introduces New Polymer

The Federal Facilities Corporation, in a release dated July 14, stated that several years ago a small quantity of a cold polymer containing butadiene and vinyl toluene, i.e. (X-689), was produced. The substitution of vinyl toluene for styrene was found feasible from a production standpoint and results of consumer evaluations indicated that X-689 was comparable to GR-S 101 (now GR-S 1500). The production of X-689 was limited as only a small quantity of vinyl toluene was available. Vinyl toluene is now available commercially and in the interest of establishing it as a possible monomer in case of an emergency, it is desirable that a larger scale evaluation be made by both a producing plant and consumers.

The number X-766 has been assigned to a 37.5 part aromatic type oil masterbatch in which the base polymer is a copolymer of butadiene and vinyl toluene. X-766 will be identical with GR-S 1710 except that vinyl toluene replaces styrene in the base polymer. X-766 is described as follows: "37.5 parts aromatic processing oil plus 100 parts base polymer—approximately 23.5% bound vinyl toluene, sugar-free iron activated, 50/50 rosin/fatty soap acid emulsified, 41°F. reaction temperature, 60% conversion. Carbamate shortstopped, staining stabilizer, salt-acid coagulated. Mooney of masterbatch 45-65 ML-4 at 212°F."

X-766 will be produced only once and a production run is to be scheduled in the near future. In its release, FFC requested all consumers to submit purchase orders by July 28.

Plans New Textile Laboratory

Plans for a new laboratory, to develop additional industrial uses for DuPont fibers, have been announced by the Textile Fibers Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. To be known as the Industrial Products Research Laboratory, the laboratory will be located at Newport, Del., and will occupy approximately 15,000 square feet in the buildings which formerly housed the department's textile research facilities. Plans also include research into the development of new fibers to meet the demands of industry. Almost $300,000 will be spent to renovate the laboratory quarters and install new equipment. In announcing the new laboratory, the Textile Fibers Department reported that its Textile Research Division will become the Textile and Industrial Products Research Division, under the direction of Dr. Howard W. Swank.

Rhodia Sets Up Service Section

Rhodia, Inc., New York, N. Y., which recently acquired the Industrial Alamask Reodorant Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has established an Engineering Service Section within the division. This service will provide the industry with specialists trained in the handling of air and stream odor pollution problems. H. C. Nichols, a chemical engineer with experience in pollution control, will serve as chief of the new section.

DUPONT PLANS TO DISCONTINUE RAYON PRODUCTION AT BUFFALO

E. I. du Pont de Nemours & Co., Inc., has announced plans to discontinue all rayon manufacturing operations at its Buffalo, N. Y., plant. The curtailment will involve more than 1,000 of the plant's 2,400 workers, some of them to be laid off in early September and the rest about April 30, 1955. More than 200 of the 1,000 will be retained or shifted to other jobs, DuPont said.

The two products which the Buffalo plant will stop making are high-tenacity "Cordura" rayon yarn, and rayon staple. Production of Cordura was begun in Buffalo temporarily during the war to meet military demands for the product, DuPont said, adding, "a reversion to normal civilian consumption of high tenacity rayon has led the company to decide, for economic reasons, to consolidate production at its Cordura plant at Richmond, Va."

Continuance of the rayon staple plant, which was the original plant of its type in the U. S., "is no longer economical as the result of the competitive situation and the lower priced staple being imported from abroad," the company stated.

The Buffalo plant will continue to turn out cellophane, sponge yard, polyethylene film and other film products, with nearly 1,400 workers employed. Besides its rayon operations at Richmond, DuPont has another rayon plant at Old Hickory, Tenn., whose operations will not be affected by the Buffalo curtailment.

DuPont said it will pay termination allowances involving about $2,000,000 to about 820 workers, and will make every effort to help them obtain other employment. In addition, all employees who are eligible for pension, or who would be eligible within five years, will be retired with full benefits under the company's retirement and pension program.

The Buffalo plant was the original home of DuPont's rayon manufacturing, beginning in 1921 as DuPont Fibersilk Co. Facilities were expanded in 1926, and the first rayon staple produced in this country was made at the Buffalo plant in 1927. DuPont's curtailment plan calls for ending manufacture of Cordura rayon yarn early in September and rayon staple output on about April 30, 1955.

Transport B-112 Truck Tire

A new truck tire, for truckers who want the latest improvements in tire design and performance at low cost, has been announced by the Firestone Tire & Rubber Co., Akron, Ohio. Named the "Transport B-112 Heavy Duty," the new tire has the same quality tread rubber, tread depth and size as original equipment tires, the company stated. It will deliver long, trouble-free mileage and will mate with any original equipment tire. The tire has a rib-type tread and tension-dried, gum-dipped cord for increased non-skid traction and greater strength, Firestone added. The Transport B-112 Heavy Duty tire may be recapped safely and economically many times, and is available in sizes 6:00 x 16 through 10:00 x 22.

Plax Sells Rod Business

Plax Corp., Hartford, Conn., has sold its entire production equipment and applicable patents for the extrusion of rods and tubes of methacrylate, polyethylene, polystyrene and "Kel-F" fluorocarbon, as well as for the molding of heavy gage sheets of polyethylene, polystyrene and all gages of Kel-F to the Westlake Plastics Co., Lenni Mills, Penna. The transaction includes a large stock of finished products, created in anticipation of a temporary shutdown. Also included are Plax manufacturing "know-how," and patents controlling the "Lubo-Film" process for extruding rods and tubes, and the "Liquo-Temp" process for annealing all products. After nearly fifteen years given to the development of present techniques, Plax sold this part of its operations to provide needed space and to permit concentration on its rapidly growing "squeeze bottle" and extruded film and oriented sheet business. Experienced Plax personnel have been retained by Westlake to supervise the transfer and installation of machinery and to develop volume and quality in production.

Schaffel Joins Brea Chemicals

Dr. G. S. Schaffel, formerly associated with the General Tire & Rubber Co., has been appointed manager of research for Brea Chemicals, Brea, Calif., a subsidiary of the Union Oil Co. of California. Following four years of fundamental and industrial research activity at the research laboratories of the Westinghouse Electric Corp., Dr. Schaffel, in 1946, joined General Tire. At the latter company he served as an executive both in chemical research and production. He held this post until his recent appointment.

American Latex Promotes Gerstin

American Latex Products Corp., Hawthorne, Calif., has announced the appointment of Harry Gerstin as vice-president in charge of the company's Stafoam Division. He was formerly sales manager of the company. The company began the production of "Stafoam" in 1950, the name applied to all foamed-in-place plastics manufactured by the company. Mr. Gerstin, the company states, has been instrumental in the growth of the Stafoam Division.

TARIFF COMMISSION REPORTS ON SYNTHETIC RESIN OUTPUT

Domestic production in 1953 of all synthetic plastics and resin materials, exclusive of cellulosics, reached record proportions of 2,777,000 pounds, increasing 19% over the 2,333,000 pounds reported for 1952, the United States Tariff Commission reported recently. Output of all cellulose plastics in 1953 amounted to 129,000,000 pounds.

This Tariff Commission report is the twelfth in a series giving preliminary statistics on 1953 sales and production of synthetic organic chemicals. Sales in 1953 totaled 2,372,000 pounds, valued at $838,000,000, compared with 2,045,000 pounds, valued at $727,000,000 in the previous year.

In 1953, polyvinyl chloride and copolymer and other vinyl resins constituted the class of resins produced in largest volume. Their output was 516,000,000 pounds, compared with 420,000,000 pounds in 1952. Sales of vinyl resin in 1953 were 464,000,000 pounds, valued at $199,000,000.

Styrene resins were next in volume of production in 1953, the output (including styrene-alkyd polyesters) amounting to 508,000,000 pounds. Sales of styrene resins in 1953 were 468,000,000 pounds, valued at $159,000,000.

Production in 1953 of phenolic and other tar-acid resins increased to 485,000,000 pounds, compared with 393,000,000 pounds in 1952, and 474,000,000 pounds in 1951.

The output of urea and melamine resins in 1953 was 257,000,000 pounds, compared with 228,000,000 pounds in 1952. Sales in 1953 were 238,000,000 pounds, valued at $75,000,000. Production of all alkyd resins, used principally for protective coatings, amounted to 467,000,000 pounds in 1953.

Other plastics and resins which were produced in large amounts in 1953 were polyethylene, acrylic, and polyamide resins.

Angier Building Plant

Angier Products, Inc., Cambridge, Mass., has begun construction of its new manufacturing plant and sales office to be located in Huntington, Ind. Operation is scheduled to start on or about October 1. The decision to build a plant in this area was prompted, the company says, by the need to provide faster service to midwestern manufacturers. A modern laboratory and sales office, headed by John J. Kerr, Western Division sales manager, will offer prompt shipping service and technical assistance. Mr. Kerr will direct company salesmen in the area, as well as company agents in St. Louis, Mo., Cincinnati, Ohio, and Milwaukee, Wisc.

General Tire Promotes Forrest

Appointment of Dean Forrest as chief engineer of the Ashtabula, Ohio, chemical plant of the General Tire & Rubber Co. was recently announced. Formerly a power engineer with United Engineers & Constructors, Inc., of Philadelphia, Penna., Mr. Forrest has been with General Tire for the past year. During World War II, he served as a mechanical engineer with the Office of Rubber Reserve of the Reconstruction Finance Corp.

NAMES IN THE NEWS

C. W. PENNINGTON has been appointed general sales manager of consumers' products, while F. A. SAWYER has been appointed general sales manager of manufacturers' products for the Footwear and General Products Division of the U. S. Rubber Co.

JAMES G. MINAHAN has been appointed resident sales representative for the Michigan Alkali Division of the Wyandotte Chemicals Corp. He will operate out of the company's Eastern District Office in New York and will make his headquarters in Philadelphia.

LEE REESER has been named to represent the Commercial Division of the Wooster Rubber Co. in Maryland, Virginia, West Virginia and the District of Columbia.

V. H. BODEN and D. B. MULLIN have been appointed assistant sales managers of the Industrial Chemicals Sales Department of the Carbide and Carbon Chemicals Co.

HAROLD NUTT, formerly vice-president and assistant general manager of the Borg & Beck Division of Borg-Warner Corp., has been promoted to vice-president and general manager of the division.

O. E. MILES, associated with the Goodyear Tire & Rubber Co. since 1932, has been appointed general manager of the Retail Stores Division.

FRANCIS H. H. BROWNING has been placed in charge of the newly-established office of Godfrey L. Cabot, Inc., in Chicago, Ill. This office will serve customers in Illinois, Minnesota and Wisconsin.

DR. FREDERICK H. MEIGS, formerly assistant general manager of foreign operations of the General Aniline & Film Corp., has been named general manager.

ARTHUR A. GINGELL, sales representative for the Electrical Wire and Cable Department of the Mechanical Goods Division, U. S. Rubber Co., has been transferred to the San Francisco branch.

CARL A. BERGMEN, technical manager of the textile chemicals section of Antara Chemicals, a sales division of the General Aniline & Film Corp., has been appointed assistant manager of chemicals at Antara's Charlotte, N. C., branch, covering the Southeast territory.

SUMNER H. WILLIAMS has been elected vice-president and general sales manager of the Dyestuff and Chemical Division of the General Aniline & Film Corp. Mr. Williams had served in a similar capacity with the General Dyestuff Corp., before it was merged with General Aniline.

WALTER F. BROWN, formerly north-central division manager for the U. S. Tires Division of the U. S. Rubber Co., has been promoted to assistant sales manager of the division.

PHILIP W. SCOTT has been appointed director of business development for the Borg-Warner Corp. In his new post he will be a member of the Research Policy and Planning Committee.

W. C. SCHADE, formerly associated with Olin Industries, Inc., has been named executive vice-president and general manager of Ball Brothers Co., Inc.

WILLIAM EWART has been elected a vice-president of Gredag, Inc., Niagara Falls, N. Y., a subsidiary of Acheson Industries, Inc.

F. ESTES SMITH, formerly a member of the president's staff of the Wyandotte Chemicals Corp., has been appointed assistant to the president.

GEORGE M. EDINGER, associated with the Burrell Corp. for the past three years, has been named sales manager of the company.

R. H. SLATE, associated with the U. S. Rubber Co. since 1929, has been appointed Pacific Coast sales manager of the Footwear and General Products Division. JACK L. BRUCE succeeds Mr. Slate as district sales manager of the Los Angeles branch.

T. W. SMALL, formerly associated with the Dayton Rubber Co., has been named Chicago division sales manager for the Dunlop Tire and Rubber Corp.

A. E. CLEGHORN, associated with the Allied Chemical & Dye Corp. since 1933, has been named executive vice-president of the National Aniline Division.

RICHARD J. THOMPSON has been appointed a sales representative for alkyd resin product sales of the Chemical Materials Department, General Electric Co.

ROBERT J. PATRICK, previously associated with the Dayton Rubber Co., has been appointed a sales representative for alkyd Dunlop Tire and Rubber Corp.

R. B. BOGARDUS, assistant manager of crude rubber purchasing for the Goodyear Tire & Rubber Co., was recently presented with a service emblem denoting 35 years of service.

WILLIAM B. MACMILLAN, formerly associated with Deering Milliker & Co., has been named manager of sales promotion and advertising for the Textile Division of the U. S. Rubber Co.

Steep Angle Conveyor Belt

B. F. Goodrich Industrial Products Division, Akron, Ohio, has announced a new steep angle conveyor belt. As shown in the photograph below, the belt provides sure footing for heavy pieces of furniture on their 35-foot journey from the rubbing room to the shipping room in the Crawford Furniture Manufacturing Corp., Jamestown, N. Y. The belt, called "Ribflex Griptop," securely grips the chests

with more than 5,700 tiny gripping blocks of rubber every square foot. The angle of descent here is 25 degrees. If desired, a case equipped with skids unloads itself automatically onto a horizontal floor conveyor at the bottom. Because the special surface of the belt permits operations at a steep angle, this installation saved six feet of space between the lower end of the belt and a wall when compared with other belts used previously.

Georgia Marble Promotes Dent

Georgia Marble Co., Tate, Ga., has elected John W. Dent executive vice-president. Mr. Dent had been a vice-president and head of the Calcium Products Division of the company since 1947. At the same time, the company announced that T. J. Durrett has been appointed head of the Calcium Products Division, replacing Mr. Dent. Mr. Durrett, a vice-president of Georgia Marble for ten years, has been in charge of all engineering.

T. H. PAULSEN, formerly assistant to the vice-president in charge of manufacturing and cost estimation of Sinclair Chemicals, Inc., has been appointed chief process engineer of the company. ROBERT C. SWEENEY, formerly market analyst of the Market Development Department, has been appointed assistant manager of market development.

WILLIAM D. SCHAEFFER of Godfrey L. Cabot, Inc., was guest lecturer at the Fourth Advanced Paint Refresher Course of North Dakota Agricultural College, Fargo, North Dakota, from July 12 to 23.

ROBERT W. OSTERMAYER, president of the Pennsylvania Industrial Chemical Corp., recently received a Distinguished Alumnus Award from Pennsylvania State University.

Sound Transparent Rubber Panels

Sound transparent rubber panels, which actually form part of the hull of the Navy's new submarine, the "Nautilus," are used as the eyes and ears of the world's first nuclear-powered undersea craft. The rubber panels, developed by the B. F. Goodrich Company Industrial Products Division, Akron, Ohio, provide a protective housing for the sonar electronic gear, yet permit undistorted passage of sound signals. While the submarine is submerged, this electronic apparatus sends and receives sound waves to detect the presence of other surface or undersea vessels, and is also an aid to navigation. The rubber panels are installed at both bow and stern, and are constructed to withstand the same sea pressures and forces that must be resisted by the steel outer hulls of conventional submarines. Company officials stated that sound transparent rubber was developed by Goodrich before World War II, with the first rubber sonar domes being produced for the Navy during that conflict. Research was accelerated after the war to develop new and better rubber compounds and to design stronger structural shapes to house advanced electronic equipment. This work resulted in rubber sonar panels of the Nautilus type, which become an actual part of the submarine's outer surface.

CMRA Plans October Meeting

A symposium on exposition marketing of chemicals, arranged by the Chemical Market Research Association, will be one of the features of the Eighth National Chemical Exposition in the Chicago Coliseum October 12 to 15, 1954. The symposium will be presented during the afternoon of Tuesday, October 12. That evening at a dinner in the Palmer House, the American Section of the Society of the Chemical Industry will present the 1954 Chemical Industry Medal to Dr. E. H. Volwiler, president and general manager of Abbott Laboratories, North Chicago, Ill. The program on exposition marketing will present several speakers, who will then lead in a discussion program. The speakers and their subjects will be: G. A. Harrington (Indoil Chemical), introductory; E. S. Nelson (International Minerals), "Principles of Industrial Product Promotion"; W. A. Lang (Monsanto), "Guides for Exhibitors"; E. P. Sutorius (Gardner Displays), "Case Histories."

Hercules Powder Names Little

Hercules Powder Co., Wilmington, Del., has appointed Dr. Robert W. Little manager of the company's Rubber Chemicals Division office in Akron, Ohio. Dr. Little succeeds Clifford S. Reppe, who has been named assistant district sales manager of the company's Paper Makers Chemical Department office in Holyoke, Mass. Dr. Little joined Hercules in 1948, serving in the Applications Research Division at the company's Experiment Station in Wilmington. In 1952, he became a member of the Paper Makers Chemical Department. For the past 18 months he has been associated with the Rubber Chemicals Division of this department.

U. S. Rubber Promotes Madsen

Vincent Madsen

Vincent Madsen has been appointed deputy managing director of the Plantation Division of the U. S. Rubber Co., New York, N. Y. He will continue to serve as general manager of Malayan American Plantations, Ltd., and Hollandsch-Amerikaansche Plantage, Mij., subsidiaries of U. S. Rubber in Malaya and Sumatra. Born in New York City, Mr. Madsen was graduated from New York University. He joined U. S. Rubber in 1937 as a junior auditor and was transferred to the Plantation Division in 1938. Three years later he became chief accountant of Hollandsch-Amerikaansche Plantage, Mij. During World War II, he was interned for three and one-half years by the Japanese on Sumatra. In 1946, he resumed his career as chief accountant of the Plantation Division. He was made general manager of Malayan American Plantations in 1949, and manager of the Sumatra company in 1952. Mr. Madsen will headquarter on the plantations.

Dunlop Tire Appoints King

Appointment of Frank S. King as technical manager for tires was recently announced by the Dunlop Tire & Rubber Corp., Buffalo, N. Y. In his new capacity, Mr. King will supervise product development, technical service and quality control of tire and tube manufacture. Mr. King comes to Dunlop from the Firestone Tire & Rubber Co., where he served as assistant to the development manager as well as head of several production departments. During his eighteen year tenure at Firestone, he was instrumental in the design and development of several of that company's major products. A long-time resident of Akron, and a holder of several patents, Mr. King is a graduate of Western Reserve Academy and also holds a bachelor of science degree from Dartmouth. He also spent one year as an exchange student at Ecole Moncel in France. He is a member of the Society of Automotive Engineers and Rotary International.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Use the coupon on page 759.

Dow Corning A-4000 Adhesive

A new silicone rubber adhesive, which sets up without pressure in 24 hours at room temperature, has been developed by the Dow Corning Corp., Midland, Mich. Identified as "Dow Corning A-4000," it may be used to bond silicone rubber to itself or to aluminum, magnesium, stainless steel, Butyl or saran. Blended with 2.5% by weight of the accompanying "Catalyst XY-22," a uniform film of the adhesive is simply brushed on the surfaces to be bonded and allowed to air dry until tacky. The coated parts are pressed firmly together to eliminate air bubbles, and permitted to cure without further pressure. Considerable bond strength is developed within 24 hours, with a maximum in about 3 to 7 days, the company states. In general, A-4000 forms a stronger bond with extrusions than with molded silicone rubber. Peel strengths of 15 pounds per square inch, measured according to MIL-C-4003, have been obtained between extruded Silastic and aluminum. With molded silicone rubber, peel strengths are in the range of 9 ppi. In either case, the bond exhibits heat and creep resistance at temperatures through 100°C. Currently available in pilot plant quantities, the cost of A-4000 is comparable to that of other silicone adhesives.

Seeks to Buy Motor Products

According to recent reports, the General Tire & Rubber Co. is seeking to acquire control of the Motor Products Corp. of Detroit, Mich., by purchase of a majority of the common stock. Motor Products manufactures parts and accessories for automobiles, home freezers and other large household appliances. Although other recent General Tire acquisitions have been achieved through exchange of stock, this offer will be for cash. General Tire is offering up to $7,000,000 for 300,000 shares of Motor Products, or about 64% of the 468,304 shares outstanding. The offering price would be equal to about $23 a share. Tenders to Motor Products stockholders will go out shortly, but details of the offer have not yet been made available. General Tire officials have declined to amplify on reasons behind the offer. The company recently acquired the Textileather and Bolta companies through an exchange of stock.

Baird Introduces Resin MS2

Baird Chemical Corp., New York, N. Y., has developed a versatile, alicyclic resin said to be capable of greatly improving the adhesive qualities of vinyl lacquers and reducing the viscosity of plastisols. Called "Resin MS2," the new resin also increases resistance to ultra-violet light, aids transparency, and resists yellowing. Resin MS2 increases the adhesion of vinyl lacquers to such difficult surfaces as glass and polished metal. It also reduces the viscosity of the lacquer. Resin MS2 is soluble in and compatible with all commonly used plasticizers. When used in plastisols, it replaces from 2.5 to 15% of the vinyl resin. Initial viscosity is improved and viscosity stability is maintained over longer periods of time, the company reports. Improvements are also found in water absorption and resistance to migration.

FINANCIAL NEWS

U. S. Rubber Co.

Six Months to June 30: Net profit of $14,442,587, which is equal to $2.23 a common share, compared with $14,440,347 for the first six months of 1953. Sales for the first half of 1954 amounted to $392,575,337, or 13.5% below the record $453,870,165 set during the corresponding period in 1953. High earnings were maintained despite the drop in sales because of a lower provision for Federal and foreign income taxes and the renegotiation of defense business, the company states. Earnings would have been higher if the company had not sustained foreign exchange losses of $903,183 due to the devaluation of certain Latin American currencies.

Hercules Powder Co.

Six Months to June 30: Net income equal to $2.58 a common share on 2,684,508 shares outstanding, compared with $2.44 a common share on 2,677,937 shares outstanding in the first six months of 1953. Sales for the first six months of this year amounted to $92,149,029, compared with $99,968,791 in the corresponding period of 1953.

American Cyanamid Co.

Six Months to June 30: Net income of $13,263,000, which is equal to $1.50 a common share, compared with $16,979,000, or $1.95 a common share, for the first six months of 1953. Net sales for the first half of 1954 amounted to approximately $196,083,000, compared with $197,533,000 for the first half of 1953.

Monsanto Chemical Co.

Six Months to June 30: Net income of $11,434,961, which is equal to $2.12 a common share, compared with $13,503,974, or $2.51 a common share, in the first six months of 1953. Net sales for the first half of 1954 amounted to $170,109,549, compared with $175,044,261 in the same period of the preceding year.

Sheller Manufacturing Corp.

Six Months to June 30: Net income of $1,455,927, which is equal to $1.53 a common share, compared with $1,830,298, or $1.92 a share, in the first six months of 1953. Net sales for the 1954 period amounted to $18,832,352, compared with $25,773,246 for the first six months of 1953.

Eagle-Picher Co.

Six Months to May 31: Net income of $609,188, which is equal to 62c a share, compared with $1,787,107, or $1.81 a share, for the same period of 1953. Net sales amounted to $32,400,906, compared with $45,477,688 for the first half of 1953.

Minnesota Mining & Mfg. Co.

Six Months to June 30: Net income after preferred dividends of $11,453,133, which is equal to $1.39 a common share, compared with $8,862,021, or $1.09 a common share, for the first half of 1953. Net sales for the 1954 period amounted to $111,874,966, compared with $106,234,119 for the first six months of 1953. As of June 30, 1954, there were 8,218,985 common shares outstanding, contrasted with 8,140,596 common shares as of the same date in 1953.

Industrial Rayon Corp.

Six Months to June 30: Net income of $3,873,965, which is equal to $2.10 a common share, compared with $4,303,574, or $2.33 a share, for the same period of 1953. Sales for the first half of 1954 amounted to $33,793,446, compared with $36,567,555 in the corresponding period of the preceding year.

Diamond Alkali Co.

Six Months to June 30: Net income of $3,115,753, which is equal to $1.26 a common share, compared with $3,140,566, or $1.27 a common share, in the first six months of the preceding year. Sales for the period amounted to $47,059,190, compared with $43,439,558 for the first six months of 1953.

General Cable Corp.

Six Months to June 30: Net income of $2,434,657, which is equal to $1.09 a share, compared with $2,971,347, or $1.36 a share, in the first six months of 1953. Net sales for the 1954 period amounted to $8,084,160, compared with $12,334,091 in the first half of 1953.

General Tire & Rubber Co.

Six Months to May 31: Net income of $3,297,747, which is equal to $2.45 a common share, compared with $3,482,750, or $2.73 a common share, in the same period of the preceding year. Sales amounted to $96,619,965, contrasted with $95,925,457 in 1953.

National Lead Co.

Six Months to June 30: Net income of $17,569,659, which is equal to $1.46 a common share, compared with $13,807,715, or $1.16 a share, in the first six months of 1953. Sales amounted to $209,222,485, contrasted with $217,936,229 in the 1953 period.

Allied Chemical & Dye Corp.

Six Months to June 30: Net income of $22,694,984, which is equal to $2.56 a share, compared with $21,719,447, or $2.45 a share, in the first six months of 1953.

Marbon Corp. Appoints Two

Marbon Corp., Gary, Ind., has announced the addition of two new staff members to its chemical research laboratories. Dr. Andrew P. Ting has joined the staff of the development laboratory as a group leader in the Polymerization Section, while Mr. Thorald C. Alexander has joined the company as a chemical engineer. Dr. Ting holds a B.S. degree in chemistry from the University of Chekiang, China, and M.S. in chemical engineering from Montana State College, and a Ph.D. in chemical engineering from the University of Missouri. Dr. Ting was formerly associated with the Catalytic Construction Co. where he was a chemical engineer in the Process Engineering Department. Mr. Alexander attended Dennison University and the Case Institute of Technology from which he received a B.S. degree in chemical engineering. Mr. Alexander was formerly associated with the W. C. Hardesty Co., where he served as chemical engineer from 1949 until his present appointment. Before joining W. C. Hardesty, he was associated with the General Chemical Co.

Expanding Chlorine Output

General Aniline & Film Corp., New York, N. Y., has announced revised plans calling for an expansion of its chlorine-caustic plant from the rated capacity of 26 tons of chlorine per day to 50 tons per day. The new facilities will be erected on a site adjoining the company's installation at Linden, N. J., and will involve an expenditure of nearly $5,000,000. Company officials stated that the virtual doubling of capacity is required by the further anticipated increase in the need for chlorine at its Linden and Rensselaer plants. Because of the expected large volume use by General Aniline, the company will not offer any of the products for this facility for general use.

Building Ammonia Plant

Columbia-Southern Chemical Corp., Pittsburgh, Penna., is constructing an ammonia producing plant at Natrium, W. Va. The new plant is expected to begin operation by April, 1955, and will cost approximately $3,000,000. Compressors for the plant will be housed in a pre-cast concrete building and the ammonia producing facility will be outside. The Natrium site was selected because of the available hydrogen supply and its nearness to industrial and agricultural outlets.

Sidney Blumenthal & Co.

Six Months to June 30: Net loss of $526,471, compared with a net income of $169,830, which was equal to $.47 a share, in the first half of 1953.

DeVilbiss Co.

Six Months to June 30: Net profit of $309,602, which is equal to $1.03 a share, compared with $459,451, or $1.53 a share, in the first half of 1953.

Merger Formally Completed

Formal completion of the merger of the General Dyestuff Corp. with the General Aniline & Film Corp., was approved by the board of directors of the latter company on July 1. The merger follows the purchase by General Aniline last November of all the stock of General Dyestuff. Both companies have been under government control by virtue of the vesting of all of General Dyestuff stock and 98% of General Aniline stock shortly after the start of World War II. General Dyestuff has been the sales agent for General Aniline dyestuffs and chemicals since it was organized in 1926. The sales agency represented the consolidation of three of the oldest dyestuff companies in the United States—H. A. Metz & Co., Grasselli Chemical Co., and Kuttroff, Pickhardt & Co., the latter tracing its history back to 1871. The marketing and sales of dyestuffs now will be carried on under the name of the General Dyestuff Co., to retain the "GDC" monogram, which is well known throughout the industry. General Dyestuff Co. will be a sales division of General Aniline. General Aniline's special chemical products will be sold and distributed by Antara Chemicals, another General Aniline sales division, and formerly a part of the General Dyestuff Corp.

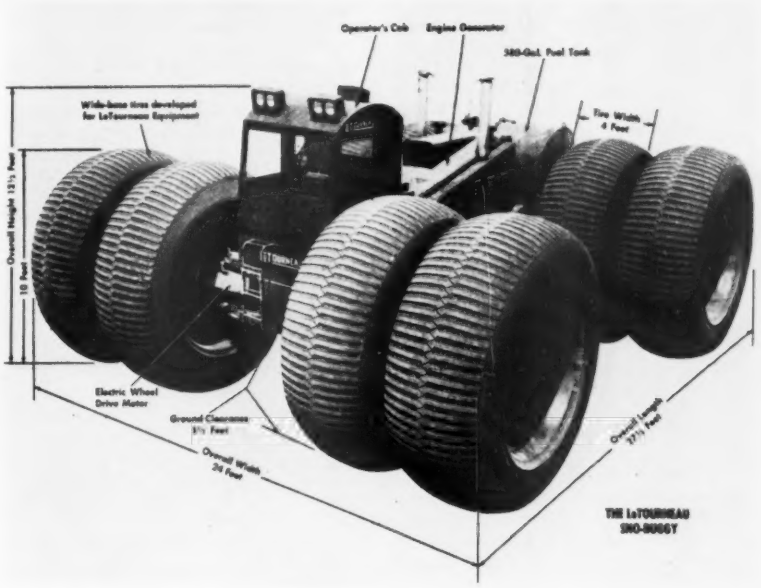
Expanding Teflon Production

A project to expand facilities for the manufacture of "Teflon" tetrafluoroethylene resin has been announced by E. I. du Pont de Nemours & Co., Inc. The expansion will about double present capacity for making the material at the company's Washington Works near Parkersburg, West Va. The projected expansion will cover both major forms of Teflon—the powders used in making molded articles and the dispersions employed in manufacturing electric wire enamels and coated fabrics. Announcement of the Parkersburg project followed disclosure by the company of a decision to build a new plant at its Louisville, Ky., works for the manufacture of "Freon-22" monochlorodifluoromethane, a basic material in the production of Teflon. Construction at Parkersburg is to be completed next summer, the company states.

Monsanto Promotes Throdahl

Monsanto Chemical Co., St. Louis, Mo., has announced the appointment of M. C. Throdahl as assistant director of the Development Department in the Organic Chemicals Division. Mr. Throdahl, who has been section manager of rubber chemicals in the Development Department, will temporarily retain this responsibility in his new position. He will headquarter in St. Louis. A graduate in chemical engineering from Iowa State College, Mr. Throdahl joined Monsanto in 1941 and has been active in research and development work in the field of rubber chemicals. In 1945, he was appointed a group leader in the company's Research Department at Nitro, W. Va., and in 1952, he joined the Development Department as section manager of rubber chemicals.

LE TOURNEAU SNO-BUGGY UTILIZES WORLD'S LARGEST PNEUMATIC TIRES



What are said to be the world's largest tires are utilized on a new exploratory vehicle and prime mover designed by R. G. LeTourneau, Inc., Longview, Texas. Called the "Sno-Buggy", the vehicle is electrically powered and controlled. The first model is now on its way to the North country for test as a trail blazer through deep, soft powdery snow. Eight of the huge tires—each one ten feet high and four feet wide, are mounted dual fashion on the four electric wheels of the vehicle. These tires provide such a high degree of support and flotation for the 23-ton vehicle that they have been tested with only five pounds of air pressure during preliminary runs of the machine at Longview. The electric wheel, announced by the company in 1953, is said to be ideally suited to mobile equipment intended for rough, shifting or spongy ground. Each wheel has its own built-in electric motor and gearing system, simplifying the design of equipment with all-wheel drive and all-wheel steer. Developed in cooperation with the Firestone Tire & Rubber Co., the tires carry from 4 to 25 pounds of pressure, depending on the weight they have to carry. The over-all width of the dual-wheel Sno-Buggy is 24 feet and the over-all length is 27½ feet. Ground clearance is 3½ feet. The unit is run by a 400 hp engine and generator which provide power for the drive motors in the wheels.

Concludes Marketing Agreement

U. S. Rubber Co., New York, N. Y., has announced the completion of a marketing arrangement with the California Oil Co., of Perth Amboy, N. J., for the sale of U. S. Royal and Fisk passenger car and truck tires. Two full lines of tires as well as batteries and other automotive accessories will be made available by California Oil to distributors handling its gasoline and oil products. These products are now marketed in New England, New York, New Jersey, Pennsylvania, and parts of Delaware, Maryland and Virginia by independent dealers.

Promotions at New Jersey Zinc

New Jersey Zinc Co., New York, N. Y., has announced the election of C. Howard George as executive vice-president, and L. S. Holstein as vice-president. Mr. George, a vice-president for the past 10 years, is a veteran of 39 years' service with the company. Mr. Holstein served for many years as general manager of manufacturing and, since 1947, as assistant to the president. He has been with the company for 42 years.

Stauffer Chemical Offers PMM

Stauffer Chemical Co., New York, N. Y., has recently increased its production facilities to supply commercial quantities of perchloromethyl mercaptan (PMM). This reactive intermediate has a list of potential uses in such products as lubricants and fuel additives, biocides, rubber additives, dyes or dye intermediates. PMM will react with amides, imides, olefins, thiols, xanthates, sodium alkoxides, and all amines. Samples and copies of a descriptive technical bulletin (No. 531) can be secured by addressing a request on company letterhead to Stauffer at 380 Madison Ave., New York 17, N. Y.

A new technical information sheet on acetoacetarylamides has just been released by the Carbide and Carbon Chemicals Co. Physical and chemical properties, applications, and shipping information are given. Ask for Form 8259.

Can't locate the office copy of RUBBER AGE when you need it? Use the coupon on page 759.

Lifewall Light Truck Tire

Because of the increasing demand for tire and tube safety in the light truck field, particularly in the scheduled delivery services, U. S. Rubber Co., New York, N. Y., has introduced its new U. S. Royal heavy service nylon "Lifewall." Lifewalls had previously been available only for passenger cars. This air container is made of two plies of nylon, and when placed in a conventional four-ply tire, actually doubles the rupture resistance. There is so much strength in the Lifewall that passenger cars have actually been driven on them without any tire casing, just as a demonstration of their inherent strength. The double layer of nylon cord serves as an effective shield which absorbs road impact, the company stated. Tires equipped with Lifewalls are virtually blowout-proof, and offer an important advance in tire safety. In the heavy service field, it is expected that Lifewalls will be particularly suitable where truck operators must maintain scheduled delivery services, such as bakeries, dairies, laundries, dry cleaners and similar businesses. Heavy service Lifewalls are being offered in four small truck sizes: 6.00 x 16; 6.50 x 16; 7.00 x 15; and 7.50 x 16.

Rise in Truck Tire Demand

The rubber industry this year will have to supply about 6% more replacement truck tires to dealers and distributors than it did in 1953, J. E. Powers, manager of truck tire sales for the B. F. Goodrich Co, said recently. Mr. Powers said the company estimates a need for 8,800,000 units to maintain dealer inventories and to replace tires which will be worn out this year. This compares with 8,271,000 truck tires delivered to dealers and distributors in 1953. The expected increase in the demand for replacement tires, Mr. Powers said, is caused by the record number of trucks on the road today. He said 1954 truck registration is estimated at 9,700,000, about 445,000 more than last year's. He pointed out that engineering and research improvements in tires have been reducing the cost-per-mile of truck tires for most operators. Goodrich, for example, introduced last year a nylon cord tire designed for drive wheels on trucks and tractors which, operators have reported, has delivered more than 100,000 miles of actual road service without a recap, Mr. Powers said.

Witco Opens Atlanta Office

Witco Chemical Co., New York, N. Y., has announced the opening of a new sales office at 1447 Peachtree St., Atlanta, Ga., to serve markets for Witco-made chemicals in the Southeast. The office is under the direct supervision of Clement Damen, who has been affiliated with the Witco Sales Department since 1924 and recently has been in charge of the company's Washington office. The Atlanta office, while serving all industries, will specialize in service to manufacturers of rubber, paint, plastics, and grease. Stocks of Witco stearates, carbon blacks, paint driers, vinyl stabilizers and plasticizers, rubber chemicals, and gelling agents will be maintained in the Southern district.

Goodrich Develops Ozonometer

Ozone, deadliest enemy of rubber products, is now being used "against itself" in the Research Center of the B. F. Goodrich Co., Brecksville, Ohio. Company research scientists, studying the many ways that ozone causes damage to rubber articles, have developed a small, simple, portable instrument which accurately measures ozone concentration. The device, which can be used in or outdoors, or in aircraft,

employs a strip of rubber thread stretched over a pulley to double its length. Half of the thread is exposed to the air where ozone can attack, rapidly weakening the exposed section. Tests require about 30 minutes but may be longer or shorter depending on the ozone concentration. The "Ozonometer" is being used to find ways of preventing ozone cracking in rubber products to extend the life and service of many articles of rubber in common use. The new instrument has been employed by Goodrich scientists since July, 1953, taking daily measurements of ozone concentration which they have found varies daily. According to Dr. Frank K. Schoenfeld, Goodrich vice-president in charge of research, "the primary objective is to find a compounding ingredient which will act as a counteragent for ozone and the new apparatus promises to be a powerful tool in this search."

Increases Plastolein Supply

Emery Industries, Inc., Cincinnati, Ohio, has announced that its "Plastolein" plasticizers are now available in greatly increased quantities. The most popular of these, "Plastolein 9058 DOZ" (di-2-ethylhexyl azelate) and "9057 DIOZ" (di-iso-octyl azelate), because of their low-temperature performance, find their widest use in vinyl films, sheeting, extruded products, coated fabrics and dispersions. This stepped-up production is the natural consequence of Emery's new ozone-oxidation plant. This pioneering venture into the large-scale commercial use of ozone involves the oxidation of oleic acid, a basic product of Emery, into two unique C_9 aliphatic acids, dibasic azelaic and monobasic pelargonic. In addition to the use of these acids in plasticizers, both have extensive potential use as raw materials in alkyd resins, polyesters, polyamides, soaps and chemical intermediates, the company stated.

Opens New Retread Plants

Four new retread plants, believed to be the largest of their type in the United States, have been opened by the Goodyear Tire & Rubber Co. in strategic areas, especially for the servicing of big off-the-road tires. Located in Philadelphia, Denver, Spokane and Los Angeles, these plants will serve entire sections of the country. Each of the new establishments also boasts some of the largest and most modern treading equipment known to the trade. The plants 'capping molds, for instance, can accommodate tires as large as 30.00—33's, weighing more than a ton. And the repair molds will handle tires up through the 30.00 sizes. Since the average recapper is not equipped for this type of work, the new facilities by Goodyear, it is believed, will prove especially helpful to contractors and others engaged in big earthmoving projects where fast, dependable service for big tires is a must. Reduction of downtime when tire trouble occurs, means a sizable money-savings to this type of operator, the company points out. The new retread plants, however, will also specialize in recapping and repairing of all popular truck and passenger tire sizes.

Gadsden Plant Anniversary

Celebration of the 25th anniversary of the Goodyear Tire & Rubber Co.'s Gadsden, Ala., plant, said to be the first rubber products plant south of the Mason-Dixon line, took place on May 14-15, with an open house and a barbecue for almost 15,000 persons highlighting the program. E. J. Thomas, Goodyear president, delivered a congratulatory address to employees and their families prior to the outdoor barbecue. He awarded lapel pins to 20 employees who had completed 25 years' service at the Gadsden plant. Goodyear's pioneer rubber venture in the South produced its first tire in 1929, following a record-breaking construction period of only four months and 16 days from bare fields to finished plant. During the first few years of operation, the southern plant had less than 1,000 employees. Today, more than 3,000 are employed and the plant is second largest in the Goodyear organization, producing tires, tubes, shoe products and military materials.

Stauffer Elects Officers

The board of directors of the Stauffer Chemical Co., New York, N. Y., has announced the election of Christian de Guigne to the new position of chairman of the board. Mr. de Guigne has been president of the company for the past eight years. Hans Stauffer, former executive vice-president and general manager, was elected president, climaxing 34 years' service with the company. John Stauffer, vice-president and secretary, with 36 years of service, has taken on the added responsibilities of chairman of the new executive committee. R. C. Wheeler was re-elected vice-president and Christian de Dampierre was re-elected treasurer. James W. Kettle, previously associated with the United States Steel Corp., was elected controller. All other officers were re-elected to the positions they formerly held.

Recently Published BTR Reports

Recent advances in the chemistry of synthetic rubbers are detailed in reports of government-sponsored research listed in the *Bibliography of Technical Reports* (BTR), published monthly by the U. S. Department of Commerce. Two of these reports, made available by the department's Office of Technical Services, are: "Fluorine Containing Elastomers," PB 111284, and "Crystallization in Butadiene-Styrene Copolymers," PB 113550. The first of these, available from OTS for $2.00, is a research report from the Wright Air Development Center detailing a method of synthesizing two fluorine-containing polymers that may be of value as low-temperature, fuel-resistant materials. The second report, available from the Library of Congress for $2.25 in microfilm and $4.00 in photostat, outlines structural considerations of crystallization in butadiene polymers and copolymers and conditions under which such crystallization may be observed.

Tests Five-Ton Black Container

Firestone Tire & Rubber Co., Akron, Ohio, recently tested a new five-ton package for transporting carbon blacks from Gulf Coast cities to Akron. Constructed of rubber and fabric, the collapsible container will be used to transport carbon blacks in less than tank car lots. The container is loaded at the top and can be emptied into a storage tank through valves and a canvas spout at the bottom. When filled it stands eight feet high and has an equal diameter. Its weight when empty is approximately 500 pounds. The five-ton container is readily adaptable to shipment by truck, barge or rail.

Introduces Polyfon Line

The Polychemicals Division of the West Virginia Pulp and Paper Co., Charleston, S. C., has introduced a new series of surface active chemicals based on lignin. The five grades of sodium lignosulfonates have been named the "Polyfon" series. Their probable uses, the company reports, are in chemical fire foams, in the dispersion of organic and inorganic pigments, and in the dispersion of cellulose acetate, vat and sulfur dyes. The Polyfons have surface active properties which also suggest possibilities in water base drilling muds, in the treatment of feed water for low pressure steam boilers, in the flotation of ores, and as tanning agents.

Sets Unique Safety Record

A unique industrial safety record—a quarter of a century without a single time-losing injury—was achieved on July 1 by employees of the Rubber Laboratory of E. I. du Pont de Nemours & Co., Inc., Deepwater Point, N. J. Since July 1, 1929, the day the Rubber Laboratory opened, it has operated more than 3,200,000 man-hours without a time-losing injury. This is the longest injury-free time span recorded to date by any unit of the DuPont organization, current holder of two world safety records in plant operations and construction.

Named Technical Representative

Robert E. Munsell

Robert E. Munsell has been appointed technical representative in New England for the American Resinous Chemicals Corp., Peabody, Mass. For the past few years, Mr. Munsell has been in charge of technical development for the Latex Compounding Department of Stein-Hall & Co., Inc., of New York City. He had also been a chemist in the Research and Development Laboratories of the Flintkote Co., Whippany, N. J. Mr. Munsell is a graduate of Pratt Institute and a member of the New York Rubber Group, the A. C. S., and its Division of Rubber Chemistry.

A.S.T.M. 1953 Proceedings

American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Penna., has published Volume 53 of its "Proceedings" for 1953. The Proceedings are published annually and include all reports and papers offered to the society in the year under review and accepted by the Administrative Committee on Papers and Publications, together with discussion. The table of contents and subject and author indexes cover all papers and reports published by the Society during the current year, which in addition to those appearing in the Proceedings include those accepted for publication in the *ASTM Bulletin* or Special Technical Publications. Of particular interest are the sections on rubber and the reports of Committee D-11 on Rubber and Rubberlike Materials.

U. S. Rubber Stockholders

Common stock of the U. S. Rubber Co. has broadened by nearly one-half in the two and one-half years since the company announced a 3-for-1 split of the stock. On June 30, there were 24,399 common stockholders, a gain of 8,037 or 49.1% over the 16,362 on record at the end of 1951. About one-tenth of this gain took place in the first six months of 1954, when 813 common share owners were added. Preferred stockholders numbered 9,554 on June 30 (129 less than six months earlier), bringing to 33,953 the combined total of common and preferred stockholders.

Want your own copy of RUBBER AGE? Use the coupon on Page 759.

Airship Joins Navy Team

First production model of the Goodyear ZSG-4 non-rigid airship, an intermediate search craft, has joined the U. S. Navy's anti-submarine warfare team. Goodyear Aircraft Corp., builder of the new airship, is under contract to build an undisclosed number of the airships. The maiden flight of the prototype model was made in December, 1953. The Goodyear ZSG-4 incorporates the latest developments adaptable to such aircraft for the purpose of locating and attacking enemy submarines in the event of war. Speed of the airship is in the neighborhood of 65 knots. It can, however, hover practically motionless or maintain low speeds. Operational versatility and endurance is augmented by special equipment providing for inflight refueling and for reballasting by a water pickup system. The Goodyear ZSG-4 has a capacity of 527,000 cubic feet of helium gas and is manned by a crew of eight officers and men.

Appoints Two Project Engineers

Hale & Kullgren, Inc., Akron, Ohio, have announced the appointment of two project engineers, Richard K. Senn and Merrill T. Ham. Mr. Senn was formerly associated with the Goodyear Tire & Rubber Co., the National Machinery Co., and the Ordnance Department of the U. S. Army. He attended Ohio State University and Ohio University. Mr. Ham comes from the Monsanto Chemical Co. During his career, he has also been associated with the Hollingsworth & Whitney Co. Mr. Ham served with the U. S. Army Engineers after graduating from the University of Maine. Both Mr. Senn and Mr. Ham will specialize in new plant layouts and automation in connection with the company's work in designing machinery and processes for rubber and plastics.

Joins Great Lakes Carbon

Robert B. Wittenberg has been elected a vice-president of the Great Lakes Carbon Corp., New York, N. Y., and appointed general manager of its Electrode Division. Mr. Wittenberg has been general manager of the Chemical Division of the General Tire & Rubber Co., Akron, Ohio, since 1951. Prior to that his record included service with the Potash Chemical Department of the International Minerals and Chemicals Corp., Chicago, Ill.; manager, market research and development, for the Mathieson Alkali Works, Inc., New York, N. Y.; and New England manager of the Grasselli Chemical Co., Boston, Mass.

DuPont Stockholders Increase

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has reported an increase of 3,821 stockholders in the company during the year ended June 30, 1954. The total number of stockholders as of that date was 148,347, compared with 144,526 stockholders as of June 30, 1953. Stockholders include 132,604 holders of common stock and 22,372 holders of preferred stock. These figures include 6,629 holders of more than one kind of stock. Owners of the company are from every state in the union.

Low Price Tubeless Tire

A new low price tubeless passenger car tire which protects against blowouts has been placed on sale in Los Angeles, Calif., by the B. F. Goodrich Co. of Akron, Ohio. Called the "Safetyliner," the new tire features a patented inner lining of rubber which retains air and thus eliminates the inner tube which is the cause of blowouts. The original puncture-sealing tubeless known now as the "Life-Saver" remains in the line. Goodrich first introduced tubeless tires for sale to the public in 1948. The company's Los Angeles district market comprises all of Southern California, Arizona and the southern tip of Nevada. The tire is also being introduced in the San Francisco district which covers Northern California. According to Goodrich, the new tire meets the demands of motorists who want a low cost tire that will offer greater safety than the conventional tire and tube combination, and travel long distances safely at high speed in all weather conditions. The tire is expected to be popular with motorists who want increased road safety at low cost. The company announced that the Safetyliner protects against blowouts because it has no inner tube to be pinched and chafed in tire cord bruise breaks. Patented rim-sealing ridges lock the tires to rims. The new tire is smoother riding, permits better handling and easier steering because of its lighter weight. Goodrich said that engineering tests prove that tubeless tires give longer mileage than a tire with tube and that dangerous heat build-up caused by heavy tubes is avoided.

New Silicone Applications

The Silicone Products Department of the General Electric Co., Waterford, N. Y., has announced a number of new applications for silicones produced by the company. One of these is a new silicone treatment for bottles that is said to substantially reduce breakage in filling and shipment. A coating of SM-70 silicone emulsion reduced breakage in the bottle-filling process to 0.014%, a drop from the normal 0.1 to 0.3% breakage level, according to six-month test results released by the Brockway Glass Co. A new silicone water-repellent called "Dri-Film" has also been introduced. This product has been designed particularly for the waterproofing of leathers used in shoe manufacture. Dri-Film has also been announced as suitable for the waterproofing of clothing.

Goodyear Reclassifies Materials

According to a recent announcement by the Chemical Division of the Goodyear Tire & Rubber Co., Akron, Ohio, two latices listed in the Chemigum group have been reclassified under the Pliolite series. Chemigum Latex 101A and 101AX are now designated as Pliolite Latex 101A and Pliolite Latex 101AX. All Goodyear Chemical Division latices now conform to the following system of nomenclature: Pliolite latices designate only styrene-butadiene types; Chemigum latices designate only butadiene-acrylonitrile types.

Armstrong Rubber Tractor Tire

Armstrong Rubber Co., West Haven, Conn., has introduced a new tractor tire which offers superior traction, longer wearing qualities and greater durability. Made of rayon cord construction, with a buried insert ply, the new tire has tremendous tensile strength, more resistance to flex fatigue, impact breaks and every type of tractor tire abuse, including under-inflation. The buried insert ply gives a full strength ply of fabric; its location in the middle of the cord body makes it more effective in resisting impact and bruise break failures. Another innovation is the flatter, wider tread with relatively narrow, "double-angle" bars made of top quality tread compound. Since the bars have far better penetration, the result is far better traction. The double angle provides a widening out of the space between the bars at the shoulder, making the tire clean readily. A new concave shape between the bars provides deeper non-skid depth and assures even greater wearing properties to the new Armstrong tractor tires. All these features, plus a more husky sidewall appearance, give the tire a new rugged look and greater eye appeal.

Technical Data on Cycolac

Marbon Corp., Gary, Ind., a subsidiary of the Borg-Warner Corp., which recently introduced "Cycolac," a new, high impact thermoplastic styrene-type resin, has announced the availability of technical literature completely describing the material. Cycolac is described as being ideal for milling, calendering, extruding, injection molding, and post-forming and is expected to find use in the manufacture of molded fittings, profile extrusions, automotive equipment, signs, kitchen accessories, machine housings, sporting equipment, electrical fixtures, control gears, ventilating systems, and chemical process equipment. Requests for technical data should be addressed to the Marbon Corp. Ask for Technical Report CY-1.

Need a personal file of RUBBER AGE? Use the coupon on page 759.

Schedules Seilon Production

According to a recent announcement by the Seiberling Rubber Co., commercial production of "Seilon", the company's unplasticized, or rigid, polyvinyl chloride will begin as soon as the new plastics plant at Newcomerstown, Ohio, is completed this summer. Production capacity during the first two years of operation should run about 1,500,000 pounds annually. Seilon will be produced at Newcomerstown in 4 by 8 foot sheets, although it can be made in other forms. Seilon sheets and plates are made by laminating calendered sheets of the material. Tubes, pipes, rods and bars can be produced by extrusion. The material can be sawed, shaped, sanded or drilled. It also can be stamped, turned or cemented and can be used with either hand or powered wood-working or metal-working tools. Seilon sheets can be welded by a special "hot gas" welding process which enables sheets to be joined together in any variety of sizes. When heated, it can be formed into various shapes with wood, metal or composition molds. It can be formed with the use of dies or blown like glass.

KSU Offers New Rubber Course

A new course, industrial chemistry of rubber and plastics, is now being offered at Kent State University, Kent, Ohio. The course carries three hours' credit, both for seniors and graduate students. It will be taught by specialists from the General Tire & Rubber Co. and the B. F. Goodrich Co. Under the general direction of Chemistry Department head, Dr. Will S. Thompson, the new course will be taught in three phases. Industrial chemistry of rubber and other raw materials will be taught by Dr. Guido Stempel, assistant director of research at General. Compounding of rubber, processing and vulcanization will be instructed by C. E. Carlson, technical engineer of General. Industrial chemistry of plastics will be taught by C. F. Gibbs of Goodrich. He is director of polymerization research at the Goodrich Research Center, Brecksville, Ohio. Twenty students already are registered for the class.

Cardolite Cashew Bis Phenol

A cashew bis phenol product, known as "Cardolite 6463," which when used as an intermediate in the preparation of epoxy resins provides far greater flexibility in the cured state, has been announced by the Irvington Varnish and Insulator Division of the Minnesota Mining and Manufacturing Co. at Irvington, N. J. This unique bis phenol is comprised of a phenol substituted in the meta position with a 15-carbon straight chain, with one or more other phenol molecules attached through their para positions at various points along the chain. It has a molecular weight of 410 which is nearly twice that of the usual bis phenol. According to the manufacturer, Cardolite 6463 requires only about half the quantity of epichlorhydrin when used in the preparation of epoxy resins. Not only does this provide substantial raw material savings, but the resins become readily soluble in the aromatic hydrocarbons.

Heavy Water Availability

Heavy water, containing 9.5 to 10.5% of O^{18} concentrate has recently been announced by the Dejac Laboratories Division of Monomer-Polymer, Inc., Leominster, Mass. This heavy water is the most concentrated form of O^{18} water thus far made available for research purposes, the company states. Each lot of water has a certificate of analysis showing the mass spectrometer determination of the O^{17} and O^{18} content. In addition, the Dejac Laboratories offer a custom preparation of O^{18} labeled compounds such as alcohols, ketones, organic acids, as well as inorganic reagents such as sulfuric and nitric acids, and various alkalis and oxides. In special cases, it is possible to offer the heavy water in a range of concentrations from 3 to 30% of O^{18} content. Approximately 1 kg. of O^{18} isotope is scheduled for this year's production. These tagged compounds are said to be potentially of great value in biological and physiological studies.

CCDA Plans New York Meeting

The Commercial Chemical Development Association will hold a dinner meeting on September 12 at the Hotel Statler in New York City. The CCDA social hour and dinner, which will be held in cooperation with the American Chemical Society, will open the 126th National Meeting of the ACS. The vigorous growth of the commercial development branch of the chemical industry, and its effect upon chemical industry progress, will be discussed at the meeting. Several prominent speakers will address the group. On October 7 and 8, CCDA will hold its Annual Fall Meeting at the Bedford Springs Hotel, Bedford, Penna. This meeting will feature discussions on the growth and worldwide influence of foreign chemical developments in recent years.

New Warehousing Facilities

Neville Chemical Co., Pittsburgh, Penna., has established new warehousing facilities at the Mystic Warehouse and Distributing Co. in Medford, Mass. The warehouse will be used for the storage of Neville resins, plasticizing oils, and other chemicals and for their distribution throughout the New England area. Orders placed directly with Neville Chemical, or with their New England representatives, T. C. Ashley and Co. of Boston, Mass., will be funneled through the warehouse to give customers extremely fast delivery service.

Hooker Opens New Plant

Hooker Electrochemical Co., whose headquarters and main plant are at Niagara Falls, N. Y., played host at Montague, Mich., for the first time on June 18, to a group of approximately 225 people visiting its newly-opened $12,000,000 caustic soda and chlorine plant. The majority was composed of representatives of chemical-consuming industries. They were accompanied by Hooker officials and sales representatives. The party inspected the plants in small conducted groups and later reassembled for dinner.

Morris Named Sales Manager

Cornelius T. Morris

Cornelius T. Morris has been appointed sales manager of the Plastic Division of the Acme Rubber Manufacturing Co., a division of the Acme-Hamilton Manufacturing Corp. at Trenton, N. J. Mr. Morris was previously associated with the Stroukoff Aircraft Corp. of West Trenton, N. J., as director of public and industrial relations. A former newspaperman, Mr. Morris served as public relations officer at Fort Dix, N. J., from July, 1946, to June, 1949. He then became affiliated with the Chase Aircraft Co., until a reorganization last year resulted in his assignment to the Stroukoff plant. Mr. Morris assumed his new duties at Acme Rubber Manufacturing on July 15.

Recent Naugatuck Reports

Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., has, in recent weeks, issued a number of Compounding Research Reports on its products. Compounding Research Report No. 22, concerns itself with "Monex", a general-purpose ultra accelerator. CRR No. 24 has to do with the "Sunproofs", inhibitors of atmospheric cracking. CRR No. 25 deals with "C-P-B", "Z-B-X", and "D-B-A", low temperature accelerators. CRR No. 26 has to do with "Flexamine", a superflexing antioxidant, while CRR No. 27 covers "M-B-T", "M-B-T-S", and "O-X-A-F", Naugatuck Chemical's thiazole accelerators. Copies of all these reports are available on request to the division.

Offers Propargyl Alcohol

A new grade of propargyl alcohol, a 40% aqueous solution, is now being offered by the General Aniline & Film Corp., New York, N. Y. The new grade is of interest for use in synthetic reactions which can be conducted in the presence of water, such as oxidative coupling to form hexadiynediol, and hydration to form acetol. It is also useful, the company states, to inhibit the corrosion of hydrochloric acid on steel. Propargyl alcohol is one of the products scheduled for manufacture in the new General Aniline plant now under construction at Calvert City, Ky., and scheduled to be completed late in 1955.

Ekco Buys McClintock Mfg.

Ekco Products Co., Chicago, Ill., has acquired the McClintock Manufacturing Co. of Los Angeles, Calif., through a purchase of all outstanding stock and facilities. McClintock became a wholly-owned subsidiary of Ekco Products as of June 30. Robert L. Lang, formerly president of McClintock Manufacturing, continues in that capacity. Ekco Products advises that there will be no change in McClintock policies or personnel. McClintock manufactures a line of advertising display specialties including rubber display parsley for butchers and grocers. The firm occupies a 40,000 square-foot plant, located on a four acre site at 2700 South Eastern Ave., in Los Angeles. Organized in 1925, it employs about 150 persons. It was reported that Ekco Products plans additional expansion of the McClintock lines and an increase in its manufacturing facilities.

Cryogenic Engineering Conference

The 1954 Conference on Cryogenic Engineering will be held on September 8, 9 and 10 under the sponsorship of the National Bureau of Standards at the NBS-Atomic Energy Commission Cryogenic Engineering Laboratory at Boulder, Colo. The first meeting of its kind in this important new field, the conference will treat engineering problems in the temperature range below —123°C. Plans call for the presentation of technical papers which will deal chiefly with problems encountered in the production, storage, transportation, and use of low-temperature liquefied gases—hydrogen, nitrogen, and oxygen. Information regarding registration and reservations may be obtained from M. M. Reynolds of the NBS Boulder Laboratories, who is chairman of the conference.

Stein-Davies 50th Anniversary

Stein-Davies Co., Long Island City, N. Y., one of the pioneer dextrine enterprises in the United States, is now celebrating its 50th anniversary. Stein-Davies Co. is the chief manufacturing subsidiary of Stein, Hall & Co., Inc. Stein-Davies was founded in 1904 when Leo Stein and Frank G. Hall joined forces with Samuel D. Davies to produce dextrine at Long Island City. As the demand for dextrines increased, the company continued to grow. In recent years, latex compounds, liquid glues, paper makers' additives, etc., were added to the company's line. The Stein-Davies plant maintains adhesive, latex, paper and food laboratories, as well as a general control laboratory.

Plans Titanium Dioxide Plant

National Lead Co. has announced plans for the construction of new facilities for the production of titanium dioxide at St. Louis, Mo. The additional capacity, about 36,000 tons a year as TiO_2, will be added on top of expansions three years ago at both the Sayreville, N. J., and St. Louis titanium pigment plants of the company. It is expected that the new production will begin in July, 1955, with the new facilities in full operation by the end of the year.

NEWS IN BRIEF

Ingersoll-Rand has available for distribution an interesting and instructive booklet on "Centrifugal Pump Fundamentals." Ask for Form 7287.

Goodrich has introduced a new line of cool, lightweight rubber raincoats designed for police wear and weighing about half as much as standard police raincoats.

Motorists coast-to-coast will soon be able to get a premium quality neoprene-covered fan belt at no extra cost. Heretofore, neoprene fan belts have been used extensively for heavy-duty service in trucks and buses, but have not been available to the general public.

Arbonite Corp., Doylestown, Penna., has made available a file folder containing descriptive information on plastic protective coatings and linings.

Rubba, Inc., New York, N. Y., has announced the development of "Rubba Latex Binder," a new, low-priced binder for jute, sisal and other fibers.

Screening material woven of Fiberglas yarns coated with a pigmented Bakelite vinyl resin coating and heat-set in a firm, uniform mesh, has recently been introduced.

Over three miles of rigid Geon vinyl plastic pipe, probably the largest single installation of its type, has been operating successfully in the Kansas oilfields since December, 1953, according to Goodrich Chemical.

Tempil Corp. has announced that as of May 1 all its facilities, including office and shipping, have been consolidated at 132 West 22nd St., New York, N. Y.

Monsanto Chemical has announced a price reduction in its plasticizer, "Santicizer 160." New prices for the plasticizer are 25c a pound in tankcar lots, 27c in truckload and carload drums and 28c in smaller quantities.

American Machine & Foundry Co. has announced that its executive, administrative and sales offices have been consolidated on four floors of the new AMF Building at 261 Madison Avenue, New York 16, N. Y.

"Oxidation of Unvulcanized Rubber: Effect of Carbon Black," is the title of a new technical bulletin in the Columbian Colloidal Carbons series made available by the Columbian Carbon Co. Ask for Volume XII, Number 1.

A complete description of "Teflon" tetrafluoroethylene fiber is now available from DuPont in booklet form.

Dewey & Almy has issued a new bulletin describing its organic chemicals. Listed are dispersing agents, polyvinyl acetate emulsions, "Everflex" emulsions, copolymer latices, copolymer resins, and plasticizers.

Modification in the structure of several types of oil suction and discharge hose produced by Goodyear, has been announced. The flat reinforcing wire previously used on both the Thor "S" smooth bore hose and the Thor Super Submarine has been replaced by a round, more durable steel wire. The firm has added Style MH Submarine oil suction and discharge hose to the commercial line for use in the handling of high aromatic fuels.

M. W. Kellogg has announced major price reductions in "Kel-F" molding powders and dispersions ranging from 22 to 42%. This is the fourth price reduction in the material since it was introduced in 1948.

A new lightweight fuel cell which forces gasoline out to the jet engine of the "Regulus" guided missile has been developed by Goodyear. The new cell is 25 pounds lighter and provides a saving over previous models.

A 140-page illustrated book containing engineering references and descriptions of insulated wires and cables made for the electric utility industry has been prepared by the Electrical Wire and Cable Department of the U. S. Rubber Co.

American Buffing and Polishing Co., Chicago, Ill., has published an illustrated brochure describing services offered in high-volume production buffing, polishing and deburring.

"Nadic" anhydride and its potential use in polyesters, organic coatings, resins, rubber, plasticizers, etc., are covered in Technical Bulletin 1-5 recently issued by the National Aniline Division of Allied Chemical & Dye.

An eight-page booklet describing the physical and chemical properties of "Aero" dicyanamide and its many applications has been published by the Industrial Chemicals Division of American Cyanamid.

"New Constant Tension From Start to Finish in Winding Roll-Fed Material," is the title of a four-page folder just issued on the new "Alquist" winder by the Hobbs Manufacturing Co.

Manhattan Rubber-Bonded Centerless Grinding Wheels are described in a bulletin being distributed by the Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J. Request Bulletin No. 6925.

A new, illustrated leaflet covering a full range of adhesives for use with "Mylar" polyester film has been issued by the Rubber and Asbestos Corp., Bloomfield, N. J.

Emulsol Corp., Chicago, Ill., has released a new technical bulletin describing "Emcol MAS", a fatty amide high M.P. wax. Ask for Bulletin No. 40.

Pennsylvania Industrial Chemical Corp., Clairton, Penna., has announced the appointment of Rice & Co. as its representative to the protective coating and allied fields in the city of Cleveland, Ohio.

Barrett Division, Allied Chemical & Dye Corp., has announced a change in its New York telephone number to HAnover 2-7300.

"Carbon Black: A Survey for Rubber Compounders" by M. L. Studebaker, is the title of a new booklet published by the Philblack Sales Division of the Phillips Chemical Co.

Midwest Rubber Reclaiming Co. has published a new price list and analysis sheet covering the various grades of reclaimed rubber produced by the company.

A new 20-page brochure giving full details and specifications for various compounding studies of "Zeolex 23", a white reinforcing pigment, has just been published by the J. M. Huber Corp.

A new catalog in color, covering its line of water hose and water suction hose, has been announced by the Boston Woven Hose & Rubber Co.

A new booklet, "What Do You Know About Trucks?", has just been published by the Automobile Manufacturers Association. The publication briefly highlights the story of the motor truck's influence on American life.

The do's and don'ts of safe operation of industrial trucks are detailed in literature now available from the Elwell-Parker Electric Co., Cleveland, Ohio.

Fire-retardant Koroseal is being used by Lexsuco, Inc., Cleveland, Ohio, in a new roof construction which may prevent disastrous industrial fires.

A new edition of "Facts About Oil", a handy reference booklet containing up-to-date statistics and other data on the petroleum industry, has just been published by the American Petroleum Institute, New York, N. Y.

Control panels for use with weighing and materials handling systems, motor controls, machine tools and plant processes are covered in a new, 4-page, two-color bulletin offered by the Richardson Scale Co., Clifton, N. J. Ask for Bulletin No. 254.

A new, peelable protective coating, designated "Strip-Kote", has just been developed by the Adhesive Products Corp., New York, N. Y.

Traction Hi-Miler Truck Tire

A truck tire of design so new as to be termed "revolutionary," and incorporating features proved to increase substantially both traction and tread life, has been announced by the Goodyear Tire & Rubber Co., Akron, Ohio. Called the "Traction Hi-Miler," the tire has a completely new body and tread, and is available in either all-nylon or rayon cord. The tread has five sturdy, zig-zag ribs and deep stop-notches, designed to give at least 24% more skid-resistance. The stop-notch feature is the first of its kind in a truck tire, according to the company. The tire also offers up to 47% more tread life, Goodyear pointed out, since the new unit is flatter and places more rubber on the road than standard tires, thereby assuring longer, more even wear, in addition to better traction. The tire has been made still more heat and bruise-resistant by an exclusive Goodyear process which tempers the cord so as to fully control its stretch. Known as "3-T" (involving tension, temperature and time), the process also controls tire "growth" and practically eliminates tread cracking, thus prolonging life of the tire carcass and making possible more recaps, the company stated. Manufactured in all popular truck sizes, the new Hi-Miler is characterized by Goodyear as "the first completely new truck tire in years." The product is the company's answer to the greater demand made upon truck tires today by heavier payloads, longer hauls and greater speeds.

New Self-Stick Labels

Professional Tape Co., Riverside, Ill., has announced a new line of self-stick labels that withstand heat, cold and extreme humidity or dryness. Available in handy roll form, there is no backing paper to pull off. It is said that operators can apply up to 800 of these labels in an hour without the use of water dispensers or licking by tongue. The back of the label is coated with a unique plastic gum able to withstand all cycles of temperature changes, and still peel off easily. The label will also withstand oil and grease. Two forms are available, including "Time Tape", a white, self-sticking continuous tape from ¾ to 2 inches wide; and "Time Labels", white labels with red border. These are available in sizes ¾ by 1 inch to 2 by 3 inches in roll form.

Durethene Names Sales Agents

Durethene Corp., leading manufacturers of polyethylene film for converters, has broadened its sales coverage of the rubber, packaging and other fields by the appointment of new representatives at three widely separated points. They are: Robert S. Bacon Co., 272 Centre St., Newton 58, Mass., Paul B. Porter, P. O. Box 84, Waimanalo, Oahu, Hawaii, and Mair-Smith Agencies, Ltd., 3207 MacDonald St., Vancouver, B. C., Canada. Durethene's main offices and plant are at 1859 South 55th Avenue, Chicago 50, Ill., their West Coast plant is at 5800 Arbor Vitae St., Los Angeles 45, Calif.

Goodrich Belt in Operation

According to the B. F. Goodrich Co., Akron, Ohio, one of the world's few belts reinforced internally with high tensile steel cables recently underwent its first trial run at the Pennsylvania Railroad's new $10,000,000 ore pier in the Delaware River at Greenwich Point, Philadelphia, Penna. Coal was used as cargo for the test run of the belt. In actual operation, the belt will be handling iron ore from

South America, Africa, Labrador and other foreign sources. The 93,000-pound, 54-inch wide belt extends 1,600 feet along a concrete pier and inshore to giant, twin 600-ton capacity hoppers which will feed ore into railroad cars. A two-belt system permits two ore ships to be unloaded at a rate of 3,600 tons of ore an hour. Future plans for expansion of the ore pier call for the belt system to handle four ships simultaneously at a rate of 10,800 tons an hour.

Ore is removed from the ships by buckets of 25-ton capacity operating from cranes extending 72 feet on each side of the pier. The buckets drop the ore into a hopper which feeds the moving belts. On the last leg of the belt's route from ship to the railcar-feeding hopper, the belt climbs 80 feet in a distance of 445 feet, negotiating an incline of 16 degrees. Goodrich engineers used a new, patented method to splice its steel cable belt on the ore pier installation. To make the splice, cable ends were cut in staggered pattern. Small tubular connectors were placed over the butted ends and then given a first light crimping. The partially made splice was then stressed to even the lengths of the cables and the connectors were given a final crimping to lock them to the cables.

Rubber and fabric removed for the splice was then rebuilt around the cables and the splice cured under tension with a conventional vulcanizer. Laboratory stress-strain tests have proved that the splice is as strong as any other part of the belt. Goodrich says that steel cable belts are being recommended increasingly for heavy service where a high tension belt is needed for long or high lift conveyors. A pioneer Goodrich steel cable belt installed on the Mesabi iron range six years ago has already carried 9,000,000 tons of ore and is still in service.

A.S.T.M. To Publish Directory

The "Directory of Commercial and College Laboratories," hitherto compiled and published by the National Bureau of Standards of the U. S. Department of Commerce, will be published in the future by the American Society for Testing Materials, according to a recent agreement between the two organizations. First published in 1927, the directory has been periodically revised. It provides information concerning the location of testing laboratories together with the types of commodities and the nature of the investigations the laboratories are prepared to undertake.

A.S.T.M. is now gathering data for the revised edition of the Directory. Every known testing laboratory will be requested to furnish information about its testing activities. Efforts will be made to reach laboratories not now listed through appropriate notices in the technical and business press. Until the revised A.S.T.M. Directory is completed, the present Directory, National Bureau of Standards Miscellaneous Publication M187, published in 1947, will continue to be available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Plans New Instrument Plant

Plans to construct what is said to be the world's most modern instrument plant on a 129-acre tract adjacent to North Wales, Penna., approximately twenty-two miles from the heart of Philadelphia, have been announced by Leeds & Northrup Co. Estimated cost of the 250,000-square-foot building, additional equipment, utilities, landscaping, parking lot, etc., is in excess of $4,000,000. Present schedules call for construction to start in the early fall, with occupancy in latter 1955. Approximately 1,300 of the firm's 3,100 employees will be at the new location. The building will provide facilities for the manufacture of Micromax and Speedomax recorders and controllers, panels and cubicles for load frequency control, as well as space for supporting units engaged in engineering, industrial engineering, order control, inspection, receiving, warehousing and shipping.

Burtonite Introduces New Gum

Burtonite Co., Nutley, N. J., has introduced "Burtonite No. 7", a new gum now being extracted in commercial quantities from cultivated guar seeds. The product is said to have unique properties as a protective colloid, thickener and film-forming agent. It is a technically pure product, free of all extenders and modifiers, and broadly speaking, a water-soluble polysaccharide. Gums are divided into nonpolyuronide and polyuronide classes. Burtonite No. 7 is classified as nonpolyuronide because only mannose and galactose are obtained on hydrolysis, the ration of d-mannose to d-galactose being approximately 1.6:1. The product is supplied as a free-flowing powder that will pass through a 175 mesh screen. Its moisture content is approximately 9%. Its water solutions are approximately neutral, and it works well in low pH mediums.

Develops Super Tire Cord

Methods to produce a super high tenacity rayon tire yarn "which is equal to the best rayon tire yarn available" have been developed by Beaunit Mills, Inc., New York, N. Y., according to I. Rogosin, president and chairman of the board. New machinery is being installed, Mr. Rogosin said, at Unit II of the North American Rayon Corp., a Beaunit subsidiary, to produce super high tenacity rayon tire yarn by the company's continuous process at the annual rate of 22,000,000 pounds. Production of the new yarn will begin about October and the unit will be in full production by the end of the year. The new installation will cost about $5,000,000, the company estimated. Original equipment at Unit II, with a capacity of 10,000,000 pounds annually, is being modified and within the next few months will also be producing the new yarn. North American has constructed a special building and installed machinery and equipment to produce nylon tire and textile yarn on a semi-commercial basis. It is also continuing experimental work with nylon staple. Mr. Rogosin also revealed that the company's patent rights to the continuous tire yarn process were sold during the year to the Celanese Mexicana S.A. of Mexico, for use in that country, for $1,000,000. Negotiations are being carried on with interests in other countries for the sale of patent rights.

U.S. Rubber Building Warehouse

U. S. Rubber Co., New York, N. Y., has broken ground for the erection of a modern, 3-story warehouse and office building near its footwear plant in Naugatuck, Conn. The new building, planned for occupancy in the spring of 1955, will be 425 feet long and 200 feet wide, with 281,000 square feet of floor space. By centralizing the storage of its finished footwear and other products, U. S. Rubber expects to speed up and improve its service to customers. A new electronic system for overnight transmittal of orders and other information direct to Naugatuck from sales branches throughout the country will be installed. Finished products will be handled almost entirely by conveyors. An inside truck dock and railroad siding will permit the simultaneous loading or unloading of 10 trucks and eight freight cars.

Goodrich LVT Fuel Cells

The Marine Corps' LVT-3 landing craft is undergoing extensive remodeling. New self-sealing fuel cells, covered with nylon fabric, will be installed. These cells, manufactured by the B. F. Goodrich Co., Akron, Ohio, are 20% lighter than the original fuel cells and will allow more cargo weight and greater fuel capacity, due to thinner cell walls. To be called the "LVT-3C," the remodeled landing craft will also be equipped with Goodrich torsilastic rubber springs, rubber ramp gate springs, bogey wheels, rubber crash pads, escape hatch and turret seals.

Need a personal file of RUBBER AGE? Use the coupon on page 759.

CANADIAN NEWS

W. M. Ecclestone and D. W. Moriarty have been appointed managers of two new sales regions within the Central Ontario Division of the Goodyear Tire & Rubber Co. of Canada, Ltd., according to C. B. Cooper, general sales manager. Mr. Ecclestone has taken over the southern region with headquarters in the company's Toronto Branch. Mr. Moriarty will manage the northern region from headquarters in North Bay. Both men will answer to W. E. Ecclestone, manager of Central Ontario Division. In making the announcement, Mr. Cooper said that the establishment of the two regions was necessary due to the vast area involved, the volume of business now handled by Central Ontario Division, and the steadily expanding markets in central and northern Ontario.

A. P. Acheson, vice-president in charge of sales of the Seiberling Rubber Co. of Canada, Ltd., Toronto, has announced the appointment of R. J. Gignac as Eastern Division sales manager and J. B. Preston as Western Division sales manager. The new appointments are the result of a decision to divide the company's distribution into Eastern and Western sales divisions. This was done to strengthen service to branches, salesmen, distributors, warehouses and dealers. Mr. Gignac will continue to make his headquarters in Montreal and Mr. Preston will reside in Toronto as formerly.

The appointment of J. G. Edmiston to the position of technical sales representative of Monsanto Canada, Ltd., was announced recently by Douglas D. Stokes, general sales manager of the company. A specialist in rubber chemicals with experience as a technician and as a purchasing agent, Mr. Edmiston is well acquainted with the chemical requirements of the rubber industry. He will be in charge of sales of Monsanto's products for that industry in Canada.

Goodyear Installs Speedwalk

An experimental passenger conveyor has been put in operation at the Goodyear Aircraft Corp., Akron, Ohio. The new "Speedwalk" is part of the Goodyear Tire & Rubber Co.'s research program into passenger conveyor belt systems. More than 10,000 employees use the 70-foot long Speedwalk on their way to and from work each day. Maximum carrying capacity of the test belt is 7,200 persons an hour. The four-ply belt is 42 inches wide and its complete, endless length is 150 feet. It is operated by a 15-horsepower motor over a grade of more than 10% and is reversible in direction. Engineers are installing various types of belts with different types of rubber covers to study the effects of weather on the Speedwalk. The company reports that studies of the installation have shown that moving handrails are not required on all passenger belt systems.

Appoints Williams and Driesch

Oakite Products, Inc., New York, N. Y., has announced the appointment of two new technical service representatives. Charles F. Williams, Jr., formerly plant manager for the Regal Ice Cream Co., in Denver, Colo., is to represent Oakite in the new Sioux City, Iowa, territory. James F. Driesch, a graduate of St. Francis College, Loretto, Penna., and formerly Pittsburgh distributor for F & E Checkwriters, is now serving in the Washington, D. C., area. Both men underwent an intensive eight-week training program at the company's New York research and engineering laboratories and in the field before taking up their new assignments.

N. Y. City Asks Conveyor Bids

According to a recent announcement, New York City will ask for bids this fall on a proposed passenger conveyor belt that would replace shuttle trains running between Grand Central Terminal and Times Square. The belt plan was originally proposed by the Goodyear Tire & Rubber Co. in 1951. New York Transit Authority officials stated that the project would require two years to build and the cost might run as high as $5,000,000. The first commercial application of a passenger belt which was installed by Goodyear in a commuter station in Jersey City was opened on May 24.

Dow Introduces Styron 647

The development of a new, light stable formulation of polystyrene plastic of particular significance to the lighting field has been announced by Dow Chemical Co., Midland, Mich. The new formulation, called "Styron 647," offers eight to ten times better light stability than general purpose polystyrene, while retaining the characteristic physical and chemical properties of the general purpose material, Dow said, adding that stabilization of the polystyrene results in nonyellowing crystal and white colors, the most commonly used colors for light fixture parts.

Wide Base Earth Mover Tire

Goodyear Tire & Rubber Co., Akron, Ohio, has developed a new low-pressure, earthmover-type tire for use on vehicles employed in large earthmoving projects. Known as the "Wide Base Earth Mover," the new tire is constructed for a wider rim than present earthmover tires and is being manufactured in only two sizes: 29.5 x 25 and 29.5 x 29. The Wide Base Earth Mover replaces the company's 24.00-25 and 24.00-29 size tires. Mounted on a 25-inch-wide rim, the new tire is available in both the "Earth Mover Sure Grip" and "Hard Rock Lug" tread designs.

Release of a new 15-minute, 16 mm., color-sound film, "Goggles and Gauntlets", has been announced by Firestone. The film is based on the 1953 Glidden Tour renewal which found more than 300 vintage automobiles wending their way from Cleveland to Detroit via Columbus and Toledo, Ohio.

For example — CRUDE RUBBER

For the best crude rubber connections in the world—look to Muehlstein! Muehlstein, with central offices in New York and London *and* direct agents in every corner of the globe provides a constant flow of information on the best crude rubber offerings. Simply contact any Muehlstein office.

You'll also find Muehlstein helpful on all types of Synthetic Rubber. A complete technical staff and laboratory facilities are available through home or regional offices.

And remember, other Muehlstein products include: REPROCESSED PLASTICS • SCRAP RUBBER HARD RUBBER DUST • SYNTHETIC RUBBER

H. MUEHLSTEIN & CO. INC

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP

REGIONAL OFFICES: Akron · Chicago · Boston · Los Angeles · Memphis
WAREHOUSES: Akron · Chicago · Boston · Los Angeles · Jersey City

OBITUARIES

Mrs. Idabelle Firestone

Mrs. Idabelle Firestone, widow of Harvey S. Firestone, Sr., founder of the Firestone Tire & Rubber Co., died on July 7 at her home in Akron, Ohio. She was 79 years old. Born in Minnesota City, Minn., Mrs. Firestone studied music at Alma College in St. Thomas, Ont. One of her compositions, "If I Could Tell You," has for years been used as the closing number on the "Voice of Firestone" radio and television programs. She was also interested in gardening and a species of marigolds has been named after her. In 1929, Mrs. Firestone donated $400,000 for the construction of the Idabelle Firestone Nurses Home at Akron City Hospital. Mr. and Mrs. Firestone were married in 1895. Of their six children, four survive: Harvey S., Jr., Leonard K., Raymond C., and Roger S. Firestone.

Godfrey H. C. Gundry

Godfrey H. C. Gundry, chairman of Morris Ashby, Ltd., of London, England, died on June 2. He was 74 years old. Mr. Gundry joined the company over 50 years ago. He succeeded his father as managing director in 1917, and in 1930 became chairman of the company. He also served as chairman of Binney & Smith & Ashby, Ltd., and Amalgamated Oxides, Ltd., and was a director of the Deanshanger Oxide Works, Ltd.; all these companies are associated with Morris Ashby, Ltd. During World War II, when the British Government took over the purchase of vital materials, Mr. Gundry was chairman of the trade associations responsible for the distribution of carbon black and North American natural asphaltum. He was also a member of the London Metal Exchange since 1915.

August J. Scheffler

August J. Scheffler, president of the Utility Manufacturing Co., died on June 26. He was 77 years old. One of the founders of Utility Manufacturing, Mr. Scheffler was responsible for many of the developments in the company's line of tire bead flipping and rubber cutting machines. A veteran of the Spanish American War and a member of several Masonic groups, Mr. Scheffler is survived by his wife, two sons and two daughters.

Charles S. Davis

Charles S. Davis, chairman of the board and former president of the Borg-Warner Corp., died on July 2 in Paris, France, while traveling in Europe. He was 77 years old. Surviving are his wife, two sons and a daughter.

Dwight N. Briggs

Dwight N. Briggs, sales manager of the Office Specialties Division of the Sun Rubber Co., New York, N. Y., died on July 26. He was 54 years old. A founder and treasurer of the Stationer's Twelve-Thirty Club in New York, Mr. Briggs was also active as clerk and a member of the board of trustees and the board of deacons of the First Baptist Church in New York. He is survived by a son and a daughter.

Erecting Laboratory Buildings

Columbia-Southern Chemical Corp. has announced plans for the construction of two laboratory buildings at Natrium, West Va. One building is designed for control and research work and the second and smaller building will house development and pilot plant operations. Construction of the control and research laboratory is expected to begin shortly. A two-story structure, the research laboratory will contain more than 35,000 square feet of floor space. The building will be fully air-conditioned. Estimated completion date is June, 1955. The development building will be a three-story structure with approximately 8,400 feet of floor space. This building will be used as headquarters for chemical engineering and pilot plant work associated with the development and improvement of product processes. Construction is now under way and the estimated completion date is December, 1954.

Testing Reinforced Plastics

Foster D. Snell, Inc., New York, N. Y., has been engaged by the U. S. Navy Department Bureau of Ordnance to study all thermosetting reinforced plastic materials available for ammunition cases and similar uses. The aim of the test program is to set up general performance specifications for reinforced plastic ammunition cases and to organize a qualified products list of manufacturers whose materials meet the minimum performance requirements. All manufacturers of reinforced plastics are invited to submit test samples which will be tested free of charge for moisture vapor transmission, shock and impact, tensile and compression strength, and ability to withstand internal air pressure. For further information, manufacturers should contact S. E. Taub, Engineering Department, Foster D. Snell, Inc., 29 West 15 St., New York 11, N. Y.

RFA17 Spray-Type Adhesive

Polymer Dispersions Co., Staten Island, N. Y., has developed a spray application, curing type adhesive with a latex base. Called "RFA17," this new adhesive can be used for flocking on milled, foam and latex rubber. RFA17 can also be used to form a reinforcing skin on foam rubber to upgrade its tensile strength.

Commerce Department Reports

Ability of various flexible pavements and base courses to accommodate jet aircraft and planes with high-pressure tires is investigated in two reports listed in a recent issue of *Bibliography of Technical Reports* (BTR), monthly publication of the U. S. Department of Commerce. The two reports are made available by the Department's Office of Technical Services. The first of these PB 113335, "Design of Upper Base Courses for High-Pressure Tires", as compiled by the Office of the Chief of Engineers, is 93 pages in length. It is available in microfilm at $4.50, and in photostat copies at $12.75. The second report, PB 113336, "Heat and Blast Effects on Tar and Tar-Rubber Pavements, Presque Isle Air Force Base, Maine", is 54 pages long. It is available for $3.00 in microfilm and $7.75 for photostatic copies. Both reports may be secured from the Publications Board Project, Library of Congress, Washington 25, D. C.

Building Giant Equipment Tire

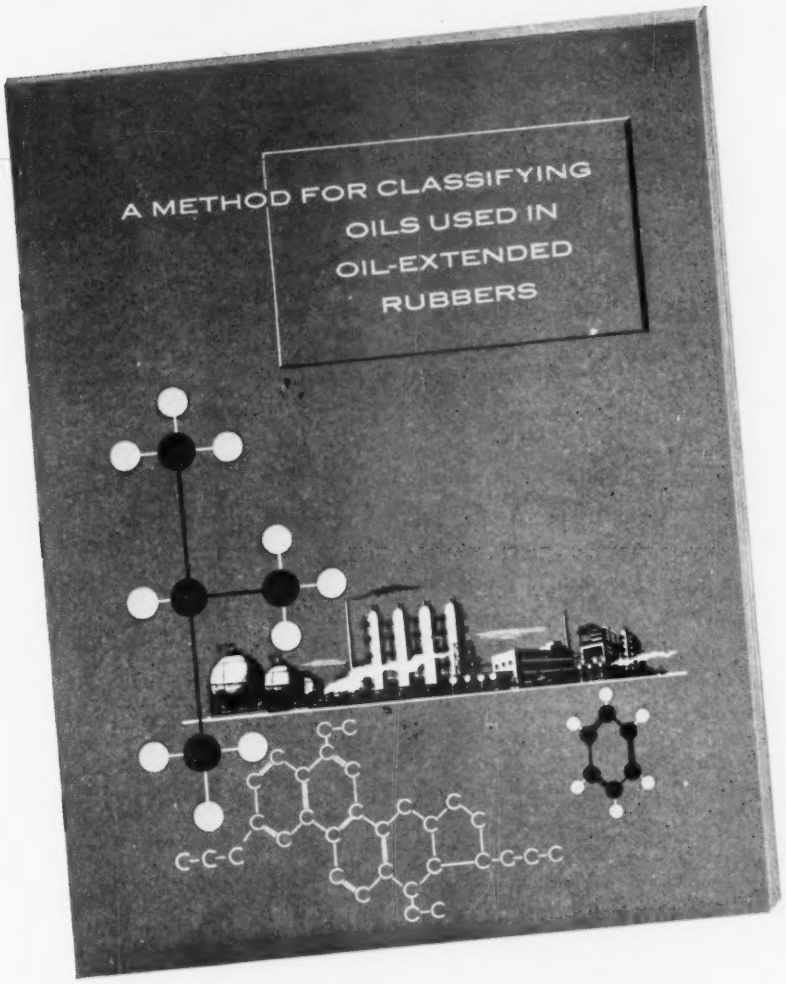
B. F. Goodrich Co., Akron, Ohio, has announced the start of production of the largest tires it has ever made—6½ feet in diameter and weighing 1,200 pounds. J. E. Gulick, vice-president in charge of manufacturing for the company's Tire and Equipment Division, said the new tires are designed to enable modern construction equipment to haul bigger loads faster. He said earth-moving machines using these tires can handle loads as high as 23 tons in such off-the-road operations as turnpike construction, dam-building and open pit mining. The new tires, size 24.00 by 29, are about three times as large and 55 times as heavy as passenger car tires, Mr. Gulick said. He said the largest tire previously manufactured by the company was 24.00 by 25.

Develops New Silicone Coating

A new silicone rubber coating for the Boeing B-47 Stratojet's aileron flap seal has been developed by the Irvington Varnish & Insulator Division of the Minnesota Mining & Manufacturing Co., Irvington, N. J. Compounded from SE-76 silicone gum, a product of the General Electric Co., the coating is said to be capable of remaining flexible and airtight at —67°F., as well as withstanding ozone and corona at high altitudes. Irvington engineers said the coating possesses notable adhesion to cloth, so that it does not peel off at top aircraft speeds. For the aircraft application, the silicone coating was applied to orlon cloth. The resulting silicone-coated cloth has been trademarked "Irv-O-lon."

Martin Purchases Frost Toy

Martin Rubber Co., Long Branch, N. J., has announced the purchase of the assets of the Frost Toy Co. of Worcester, Mass., manufacturers of toy printing sets. All the Frost equipment has been moved to the Martin Rubber plant in Long Branch. Martin Rubber will continue the manufacture of the printing sets formerly made by Frost and will add several newly-designed sets in the near future.



NEW SUN OIL DATA BOOK HELPS YOU SELECT OIL-EXTENDED RUBBERS

Here's a new and simplified system for classifying oils used in extending GR-S polymers. Sun Oil Company's research group has been working on this problem for many years, and the results are offered to you in this free data book.

Oils used to extend GR-S polymers vary widely in their hydrocarbon composition. This is a generally known fact. But up until now, there has been no easy way to tell what effects they have on your finished products.

This data book does it—taking into consideration the quality of the finished product, ease of processing, functioning of the vulcanizate at subzero temperatures, and many other details.

For a free copy of this book, just write Dept. RA-8.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

Refiners of famous High-Test Blue Sunoco Gasoline

Olfactory horrors — associated unmistakably with the manufacture of rubber and rubber-products — are, literally, being wafted away! ALAMASK makes rubber manufacturing *and* rubber products *aromatically pleasant!*

Reodorization makes rubber more appealing. Through masking or modifying their disagreeable odors with ALAMASK, rubber products become infinitely more saleable to the consumer, working conditions are tremendously improved, and community-relations become a good deal more friendly.

ALAMASK reodorants produce no significant effect on rubber processing characteristics or rate of cure. And, ALAMASK is designed to withstand the processing conditions associated with the recommended uses.

	Latex					Dry Rubber				Elasto-Plastics		
"ALAMASK" TYPE RECOMMENDED	Foam	Sponge	Dipped Goods	Bonded Fibers	Adhesives	Natural	Synthetic	Reclaim	Chemically Blown	Polyvinyl	Polyaryl	Plastiols
AA										X	X	X
AF					X		X		X			
AO or AO-X					X	X	X		X			
AR or AR-F			X		X							
BF or BG-X	X	X	X		X	X	X					
BGM or BGM-X	X	X		X		X						
CY					X				X			
DJ	X	X	X				X		X			
DL							X		X			
H			X		X			X	X	X	X	
LD	X	X	X	X	X	X		X				
ND or ND-X	X	X	X	X	X	X	X	X	X	X	X	
O	X	X	X	X		X	X		X	X	X	X
OS or OS-X	X	X	X	X			X					

For use in latex, the water-dispersible "ALAMASK" form is recommended. The water-dispersible forms are designated by "-X" or "-F" following the "ALAMASK" type name.

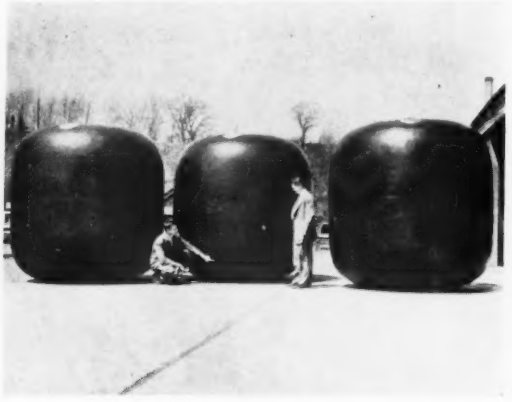
Product reodorization and odor abatement are no longer problems. Send now for detailed use-and-information booklet. Write to Industrial Reodorants Division (Alamask), Rhodia, Inc., 230 Park Ave., New York 17, N. Y.

Rhodia INC.

NEW GOODS

U.S. Rubber Collapsible Containers

Containers for the shipment of granular and powdery chemicals have been developed in 500- and 2,500-gallon sizes by the U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y. Constructed of plies of high strength cord fabric and synthetic rubber molded into one piece, the containers are reinforced by several strong, flexible lifting cables, which are attached to a single lifting ring at the top of the container. The



exterior and lining of the containers are of neoprene. A six-inch opening at either end is for filling and emptying. Easy to fill, empty or clean, they are said to be weatherproof, leak-proof and non-corrosive, and can be collapsed for return shipment or storage. When full, the 2,500-gallon container, seen above, is eight feet high and eight feet in diameter. The 500-gallon container is seven feet high and approximately four feet in diameter.

Open Hearth Cooling Hose

A rubber hose, which circulates water inside the hollow steel doors of open hearth furnaces to keep them from melting, has been developed by the Industrial Products Division of the B. F. Goodrich Co., Akron, Ohio. Constructed of a special, heat-resistant rubber tube, armored with wire for strength and protected against the heat by asbestos, the new hose has outlasted the life of a test furnace to which it was connected, the company reports. When the heat within the furnace changes the water circulating through the doors to steam, the same type hose can be used to draw off the steam and hot water. The flexible construction of the hose allows the doors to open while the hearths are recharged. This flexibility also permits the use of shorter hose lengths to make connection between the doors and the water system. Due to its light weight, the hose can be installed by one man.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Why not enter a personal subscription? Use the handy coupon on page 759.

GISY Rubber Drain Pipe

A two piece rubber unit developed by Hanns P. Paul, 8 Obere Weissgerberstrasse, III, Vienna, Austria, is now being used in that country as a replacement for lead and brass couplings used in sink drain systems. Called the "GISY" unit, a plumber is not needed in order to connect it to a washbasin or wall outlet. In addition, when the outlet becomes stopped up, squeezing the rubber trap creates a suction which will clear the

drain pipe. Tested during the past four years in homes and hospitals in Austria, the unit was found to be leakproof. Mr. Paul also states that the GISY unit was found to be unaffected by lye or acid solutions and temperatures up to 200°F. Mr. Paul holds several European patents on the unit, and a United States patent is pending. He would be interested in hearing from an American manufacturer who would like to produce the unit under license in the United States.

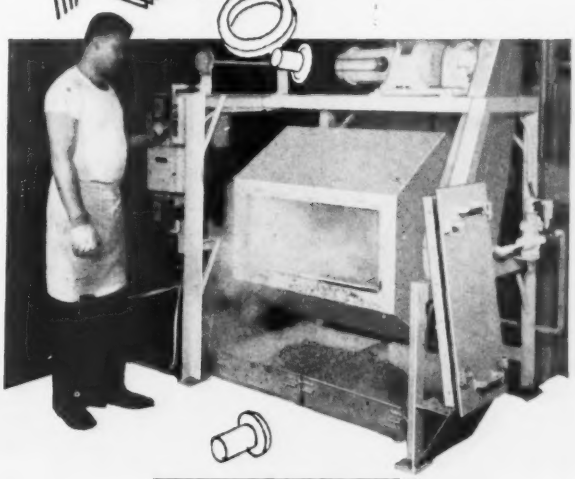
Flexible Silicone Tubing

A lightweight, flexible tubing, highly resistant to wide temperature and pressure ranges, has been developed from General Electric's SE-100 silicone rubber compound as part of the de-icing system of the new Grumman S2F-1 Sub-Killer aircraft. Designed and fabricated by the Flexible Tubing Corp., Guilford, Conn., the tubing is strong, easy to handle and can be installed quickly and economically in the wings of the plane. It can be used without fear of collapsing in situations where bends up to 180° must be made, and is capable of withstanding temperatures ranging from 250°F. to −65°F.

My-Tee Midget TV Antenna

Universal My-Tee Midget Corp., 409 Reed Street, High Point, N. C., has introduced a new, miniature indoor television antenna. All electronic parts of the antenna are encased in neoprene, adding to its long life. Its small size—approximately two inches in diameter—permits it to be concealed behind drapes, under the rug, etc. The manufacturer states that the unit will give as sharp and clear a picture as any other television antenna.

NEW!



THE LIQUIMATIC RUBBER TUMBLING BARREL

Smoother Parts ***Shorter Time***

Designed, engineered and manufactured by LIQUID ...world leader in CO_2 refrigeration for over 60 years. Only the LIQUIMATIC Tumbling Barrel gives you *all* these advantages:

- Uses either liquid CO_2 or Dry Ice.
- Special "freeze-lock" construction has no cold-conducting connections from liner to shell.
- Variable Speed Drive—ranges from 15 to 52 RPM—gives the ideal speed for all types of tumbling.
- Automatic control of time and temperature...down to −100°F.
- Removable stainless steel baffles—greater tumbling flexibility.
- Heavy duty construction throughout.
- No other barrel—at any price—offers the tumbling efficiency of the LIQUIMATIC. Get the complete story—mail the coupon below.

For any Tumbling Barrel or Tumbling Operation —use RED DIAMOND CO_2 — liquid or solid.

IN WHICHEVER FORM YOU PREFER...

LIQUID — Liquiflow — *Tank truck to CO_2 receiver*

SOLID — Red Diamond Dry Ice — *In the familiar 50 lb. blocks*

MAIL THIS COUPON TODAY

THE LIQUID CARBONIC CORPORATION

3102 South Kedzie Avenue • Chicago 23, Illinois

Please send me full information on the new LIQUIMATIC Rubber Tumbling Barrel.

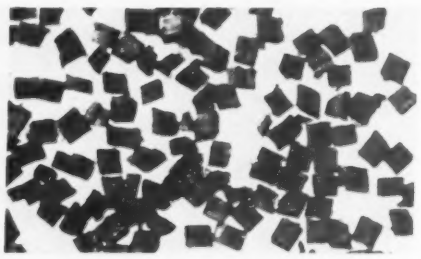
Name _____

Company _____

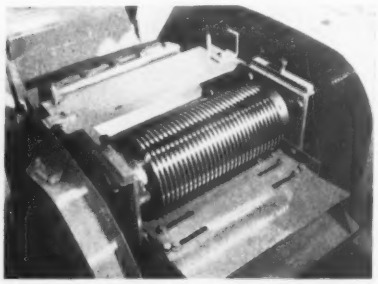
Address _____

City _____ Zone _____ State _____

PELLETIZE SHEET RUBBER IN ONE OPERATION



Pellets produced by cross cutting rubber sheet stock; a straight line continuous operation.



Rotary shears that cut rubber sheets into strips. Knife cylinder for cross cutting in background.

TAYLOR-STILES NO. 218 DICING CUTTER cuts sheet rubber stock into strips and then cross cuts the strips into small uniform particles in preparation for extruding or molding.

Speeds of the slitting cutter and cross cutting head are synchronized to produce pellets of precisely uniform dimensions.

OTHER TAYLOR-STILES CUTTERS cut continuously extruded stock into blanks of uniform dimensions for molding, and cut rubber scrap and old tires for reworking.

Send for illustrated folder App. 202 listing cutters we make for the rubber industry.

TAYLOR-STILES and Company
CUTTING MACHINES & KNIVES

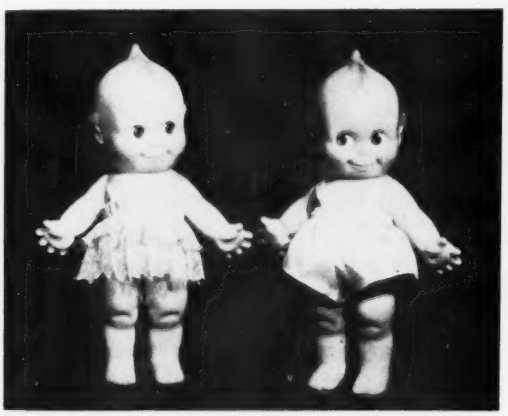
216 Bridge Street **Riegelsville, New Jersey**

Uskon Heating Panels

An indoor heating system which can be installed on the ceiling of a room, thus eliminating the need for radiators, pipes and ducts, has been developed by the Mechanical Goods Division of the U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y. Panels have been constructed of paper-thin sheets of specially compounded, electrically-conductive rubber, sandwiched between sheets of aluminum foil and plastic. Called "Uskon Heating Panels," these thin panels are glued to the ceiling with a special adhesive. Electrical connections for the panels fit into the wall moldings. Rated at 22 watts (75 BTU's), the panels operate on either a 230 or 115 volt system and are regulated by a thermostat in the room. When in use, the entire surface of the panel heats up uniformly, providing "sunshine-type" heat. Panels are made in three sizes up to 4 x 6 feet. They weigh only six ounces a square foot and can be painted to blend with any color scheme.

All Vinyl Kewpie Dolls

Cameo Doll Products Co., Port Allegany, Penna., is producing a line of soft, life-like, vinyl Kewpie dolls in girl and boy styles. All dolls are fully jointed and have painted hair and glassine eyes. Girls are dressed in net



ballet skirts and boys in boxer trousers. They are 9½ inches tall. Also available is a 13½-inch girl Kewpie doll, dressed in a pinafore and shoes and socks. This doll coos softly when squeezed.

Criball Vinyl Crib Toy

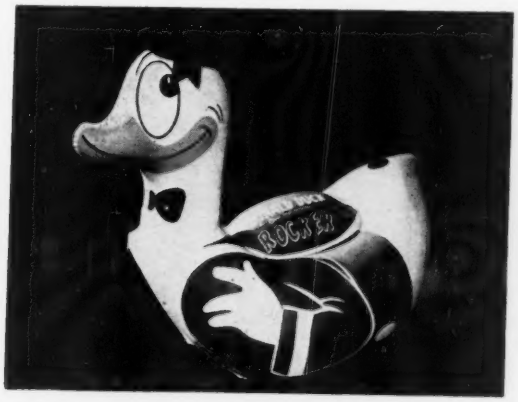
Molded Latex Products, Inc., 27 Kentucky Avenue, Paterson 3, N. J., is producing a new crib and bath toy molded of Bakelite vinyl resin-based plastisols. The new toy has a built-in perfumed baby powder scent and is molded in a simple ball shape that cries softly when squeezed. The pebble grained surface of the toy, called "Criball", makes it easy to grasp. A slight squeeze produces a gentle crying sound that is said to be pleasing to an infant. The toy will resist water and soaps and can be taken along to float in baby's bath. Color is integral with the ball and cannot be washed out of the toy. Criball may be sterilized, the manufacturer states.

Bostrene Plastic Air Hose

A light-weight, small-diameter, plastic air hose, for use with pneumatic tools, has been developed by the Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge 39, Mass. The new "Bostrene" plastic air hose is bright red in color, to allow for quick identification of power air lines. The ¼-inch size hose weighs only 8.8 pounds per hundred feet. This reduction in weight permits the use of lighter pneumatic tools in place of heavier electric ones, the company states. It also saves the cost of manual lubrication of tools by enabling the use of line oilers. The Bostrene plastic air hose comes in two sizes: ¼-inch inside diameter size with ⅛-inch wall, and ⅜-inch inside diameter with 3/16-inch wall; both can be utilized at working pressures up to 120 pounds at 75°F. The hose is both flame and abrasion resistant.

Donald Duck Inflatable Toy

Kestral Corp., 25 Willow St., Springfield, Mass., is manufacturing an inflatable toy rocker shaped like Donald Duck. Made of "Boltaflex," the rocker is two feet long and 21 inches high. As the rocker inflates, a



saddle comes into view. Donald Duck wears a sailor suit and hat—the latter attached to his head by a snap. Duck squawks accompany the rolling and rocking of the toy.

Rusco Elastic Marine Cord

Russell Manufacturing Co., of Middletown, Conn., is producing an elastic cord especially designed for marine use. Supplied in either white or nautical blue, the cord is covered with a special glazed yarn that is said to be highly resistant to abrasion and to all forms of marine rot. Called "Rusco Elastic Marine Cord," it is recommended for use as mooring line, deck lashing, in anchor lines and in ships' galleys.

A new, lightweight drain tray to protect kitchen sinkboards is being molded of Bakelite polyethylene by Columbus Plastic Products, Inc., Columbus, Ohio. Weighing less than one pound, the handy drain tray measures an ample 15½ by 20 inches, big enough to hold a standard size dish drainer.

Now . . . Up-To-The-Minute

INTERNATIONAL TECHNICAL ASSISTANCE

- To tire and other rubber manufacturers abroad, who desire to learn the latest American "Know-How" . . . cut manufacturing costs—we offer comprehensive Technical Assistance at low cost.
- Dayton Rubber's I.T.A. plan has been in existence for 20 years. Rubber experts and teachers that give unexcelled technical assistance at a surprisingly nominal cost . . . all backed by 48 years of recognized leadership in the rubber industry . . . with 4 U. S. plants.
- We train your personnel in these modern plants . . . help you establish the latest formulae for processing natural and all new types of synthetic rubbers and textiles . . . latest "Know-How" in Tubeless Tires, Butyl Tubes, Rayon and Nylon Cords, Carbon Blacks. We also design factories and supervise machinery installations if desired.

Write: International Technical Assistance Division

I.T.A. — THE DAYTON RUBBER CO., DAYTON, OHIO

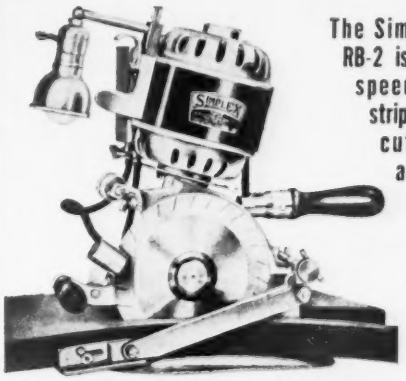
Dayton Rubber

Dayton 1, Ohio, U. S. A.
Cable Address: Thorobred

SINCE 1905, MANUFACTURERS OF TIRES AND TUBES

SIMPLEX REG. TRADE MARK

CUT 2500 FEET OF STRIP PER HOUR



The Simplex Model RB-2 is a new high speed, portable strip cutter that cuts efficiently and accurately.

U. S. Patent 2,294,497

The new Model RB-2 has a maximum cutting thickness of two inches, weighs 44.5 pounds, and is available in both A.C. and D.C. types. Manually operated, the machine is capable of cutting up to 20,000 feet of rubber strip in eight hours. A series of slits in the edge of the cutting blade carries water from a reservoir into the cut and not just to the top of the rubber being cut. This method lubricates the entire cut and produces a straight and even edge.

Simplex Cloth Cutting Machine Co., Inc.

Manufacturers of a Complete Line of Cloth Cutting Machinery

270 West 39th St. New York 18, N. Y.
Cable Address—SIMPLEX, N. Y. *Phone*—WIsconsin 7-5547

PLYMOUTH STEARATES

ZINC STEARATES
WETTABLE ZINC STEARATE
CALCIUM STEARATES
BARIUM STEARATE
MAGNESIUM STEARATES
ALUMINUM STEARATES

PLYMOUTH BRAND METALLIC STEARATES

Whether it's Plymouth Zinc Stearate . . . for use as a lubricant or dusting agent . . . or another of the fine Plymouth Brand Stearates . . . you are **always** sure of getting Quality and Uniformity . . . with every shipment.

Write for samples and Data on Plymouth Zinc Stearate #220 — a special "Sponge Rubber" grade.

M. W. PARSONS-PLYMOUTH, INC.
59 BEEKMAN STREET, NEW YORK 38, N. Y.
Telephone: BEEKMAN 3-3162—3163—3164 Cable: PARSONOILS, NEW YORK
DISTRIBUTION POINTS AND AGENTS IN ALL PRINCIPAL CITIES

TIRE MOLDS
SPECIAL MACHINERY
TEAR TEST EQUIPMENT

fair prices
reliable delivery
good workmanship

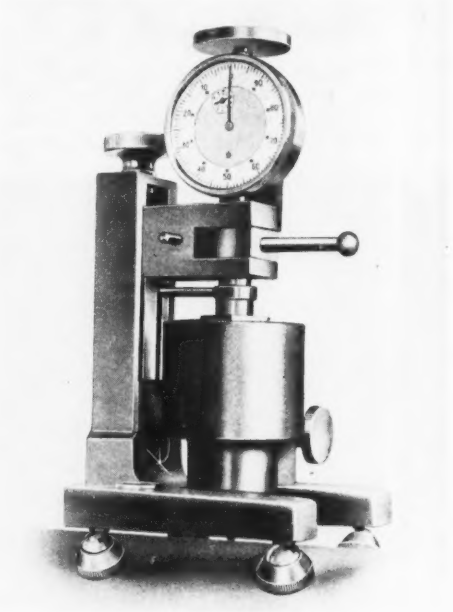
your inquiries are solicited

THE AKRON EQUIPMENT CO.
AKRON 9, OHIO

NEW EQUIPMENT

Zwick 124 Hardness Tester

Designed as a single unit for the hardness testing of all rubbers, the Zwick 124 Rubber Hardness Tester, available through William J. Hacker & Co., Inc., 82 Beaver Street, New York 5, N. Y., is adaptable for determining Pusey and Jones indentation numbers as well as hardness values for all foam rubber and similar materials. Equipped with the standard ⅛ inch diameter ball identor actuated under a load of 1 kg., the indentation is read from an indicator gauge graduated to 0.01 mm. to give the indentation number as specified in ASTM D 531-49.



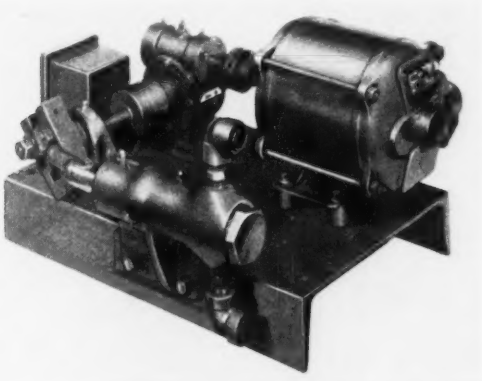
The instrument is mounted on a pedestal with four movable feet which adjust themselves to either a flat horizontal surface or a curved surface such as that of rubber-covered rolls. Although rugged in design, the machine weighs less than 18 pounds. A test stand is available for testing finished products of various shapes and enables the height and position of the tester to be adjusted for the testing of specimens of small diameter.

In addition, the instrument can be equipped to test the hardness of foam rubber by using readily interchangeable plexiglas platens. The company states that by the use of these two platens of 5 and 25 square cm., values for any foam rubber hardness can be obtained.

Re-usable high pressure **Hydralink hydraulic couplings** requiring no special tools for hose assemblies are now being offered by the Condamatic Co., New York, N. Y. The couplings are available in a standard range of sizes for both one and two wire braided, rubber covered hoses. Both fixed and swivel male end couplings are available.

Motor-Driven Controlled Volume Pump

A new, motor-driven controlled volume pump for use in proportional feed systems has been introduced by the Milton Roy Co., 1300 East Mermaid Lane, Philadelphia 18, Penna. A mechanical, single revolution clutch



arrangement permits one stroke of the pump in response to an electrical signal to effect feed of an additive in proportion to main line flow rate. This signal may be transmitted by a timer, electrical contacts on a positive displacement meter, etc. These pumps have capacities from one pint to 1,350 gallons per hour, against discharge pressures up to 50,000 pounds per square inch.

Model M Servis Recorder

To provide an immediately visible record of the busy and idle time of plant machinery, including rubber molding presses, a new recorder has been developed by the Service Recorder Co., 1375 Euclid Ave., Cleveland 15, Ohio. Besides use to improve machine productivity, the new unit, called the Model M Servis Recorder, is said to be valuable in time studies to set rates or as a

check on the exactness of processing operations. Because it requires only a wire connection to the machine's motor, the new recorder can be located anywhere—on an office wall, for example. The recording can be seen as the machine operates. No ink or pen are used; a sapphire stylus does all the marking on a wax-covered chart. To prevent unauthorized opening of the recorder, the chart shows whenever the case was locked or unlocked. The standard 6-inch diameter, 24-hour chart will revolve 3 times, making a total record of 3 days and 3 nights on a single chart. 12-hour and 8-hour charts are also available. If desired, an elapsed timer or counter is included in the recorder.

IMS SILICONE BOMB
MOLD LUBRICANT
It's Pure - It's Dry
ON RUBBER, LOW PRESSURE COMPRESSION INJECTION MOLDS
PRICES:
Sample Can..... $ 2.00
Unbroken Dozen $18.00
(at $1.50 each)
Unbroken Gross $197.40
(at $1.37 each)
Further discounts on larger orders
IMS SILICONE SPRAY MOLD RELEASE
long lasting! non-marking!
IMS PURE UNDILUTED SILICONE SPRAY IS THE PERFECT MOLD LUBRICANT
INJECTION MOLDERS SUPPLY CO.
3514 LEE ROAD WYoming 1-1424 CLEVELAND 20, OHIO

Product Evaluation
and New Uses for Established Products go hand in hand at the
SNELL RESEARCH LABORATORIES
Recently we evaluated a new carpeting with Foam Rubber Backing — Showing Increased Durability and Reduced Cost.
It Well May Be That
Snell Research Can Similarly Serve You
Our Rubber Division is Complete and Comprehensive
Your Inquiry
Involves No Cost or Obligation
RESEARCH LABORATORIES
FOSTER D. SNELL INC.
29 WEST 15TH ST. NEW YORK 11, N.Y. — WA 4-8800
CHEMISTS · ENGINEERS

"RECLAIMED RUBBER"

by JOHN M. BALL

The Story of an American Raw Material

****

CONTENTS

1. Early History
2. Mitchell and the Acid Process
3. Marks and the Alkali Process
4. Miscellaneous Reclaiming Process
5. Companies and Associations
6. Scrap Rubber
7. Manufacture
8. Properties and Uses
9. Statistics
10. World War II

Epilogue: What of the Future?
Bibliography

6 x 9 in.—248 Pages—Illustrated

****

"It is no exaggeration to say that this is one of the most competent historical studies of an American industry which has yet been published."

Penrose R. Hoopes in MECHANICAL ENGINEERING

PRICE | **$5.00 in United States**
$5.50 in Other Countries

(Add 3% Sales Tax for Copies sent to N.Y. City)

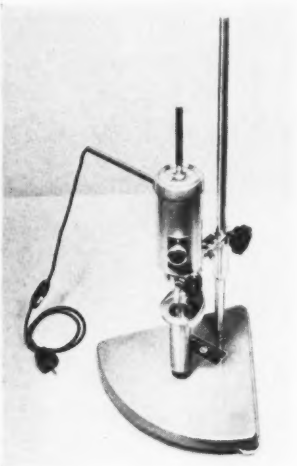
Exclusive Sales Agents

RUBBER AGE

250 West 57th St. New York 19

Drage Viscometer

Designed to meet the need for rapid and accurate detection of alterations in the chemical and physical properties of various substances, including rubber latex, the Drage Viscometer is available from Drage Products, 406 Thirty-Second St., Union City, N. J. The unit was perfected by the Chemical Institute of Dr. A. G. Epprecht of Zurich, Switzerland. According to Drage



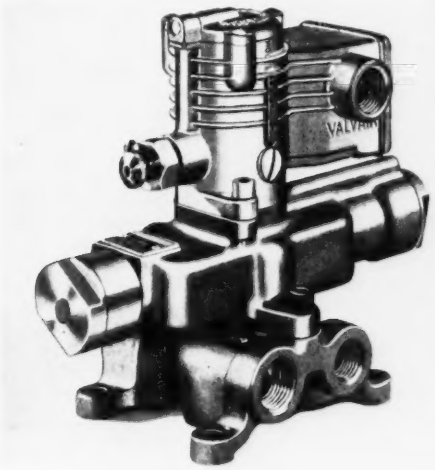
Products, special features of the new viscometer include: (1) Frictional forces, which are linearly related to the viscosity, are transmitted through a rotating measuring element to a rotatable mounted motor, the torque of which is opposed by a precision constant modulus hairspring; (2) A pointer, which is attached to the motor casing, directly indicates the viscosity while in operation; this feature makes possible a fast, accurate method of detecting alterations in the chemical and physical properties of substances; (3) The instrument has three speeds—20, 64 and 200 rpm.; a gear box is incorporated for this purpose and its design is such that the measurements are entirely unaffected by friction in the gearing, and (4) Changes of viscosity are indicated instantly, making it ideal for continual control purposes. A direct recording attachment is an available accessory.

The purpose of a new heated pump developed by the Research Appliance Co., West View Road, Pittsburgh 9, Penna., is to supply laboratories, pilot plants and industrial plants with a metering pump that will handle small volumes of viscous materials, such as bituminous tars. Called the **Corson-Cerveny Heated Pump,** it can be equipped with steam or electrical heating or a combination of both.

Lamson Corp., Syracuse, N. Y., has introduced a new **automatic pallet loader** with a side pallet magazine which will handle up to 48-inch wide pallets. This new feature makes possible the placing of two-way pallets in the pallet magazine with their pick-up opening facing the side. Previously, pallet openings had to face the rear of the machine in order to be stacked in the rear pallet magazine.

Speed King Air Control Valve

Valvair Corporation, 966 Beardsley Ave., Akron 11, Ohio, has expanded its line of solenoid pilot-operated control valves. The new Speed King is designed to meet the standards set by J.I.C. All parts are totally enclosed. The junction box for electrical control is cast integral with the housing of the pilot control unit. The pilot can



be mounted in two directions over the base and is universal to all assemblies. All parts are non-corrosive. The base is cast bronze; the pilot valve, a zinc base alloy casting. The stem in the base and plunger in the solenoid are the only moving parts. Pressure range is from 35 to 200 p.s.i. for air and low pressure hydraulics. Two-, 3-, 4- and 4-way-5-port (2-pressure) models with pipe sizes from ¼-inch through 1-inch are offered. Foot or sub-base (manifold) mounting is optional in all sizes and models excepting the 4-way-5-port (2-pressure) valve. Any voltage and cycle can be accommodated.

Announcement has been made by the General Electric Co., Schenectady, N. Y., of the availability of a new **portable hand tachometer** which features a scale-changing device which reduces misreading of its various ranges. Three different models, each having three ranges, are capable of measuring rotational speeds from 2 to 100,000 rpm and linear speeds from 2 to 10,000 fpm with accessories.

Designed to provide continuous and automatic detection of hydrogen sulfide, the **SU Hydrogen Sulfide Detector** has been introduced by Viking Instruments, Inc., East Haddam, Conn. In addition to such detection, the new unit records its findings in precise, quantitative measurement and maintains this record in chart form.

An entirely new concept of valve topworks, said to be revolutionary in the pneumatic control industry, features the new **LB Series Control Valves** recently introduced by the Conoflow Corp., 2100 Arch St., Philadelphia 3, Penna. The new valves are presently available in sizes up to and including 4 inches, and for Series 15, 30 and 60 body ratings.

THOMASTON Fabrics

A DEPENDABLE SOURCE OF SUPPLY FOR
INDUSTRIAL TEXTILES
FOR THE
RUBBER INDUSTRY

SUCH AS:
TIRE FABRICS • HOSE AND BELT DUCKS • YARNS
CHAFERS • THREADS • SHEETINGS • LAMINATING FABRICS
DIVERSIFIED COTTON FABRICS. Whatever your needs our Industrial Textile Specialists will be glad to discuss them with you. We solicit your inquiries.

THOMASTON MILLS
Thomaston, Georgia • New York Office: 40 Worth St.
Akron, Ohio Office: 308 Akron Savings & Loan Bldg.

BROCKTON
CUTTING
DIES

Meticulous workmanship has been a tradition at Brockton Cutting Die for three generations. That's why rubber manufacturers turn to us for quality dies of all kinds . . . for dies that really retain their cutting edge. Our experience and facilities enable us to turn out a cutting die for every type of service.

Send your blueprint today for prompt quotation.

BROCKTON CUTTING DIE & MACHINE CO. INC.
CUTTING AND PERFORATING DIES

AVON, MASS.

ohopex® r-9
FOR PERMANENT LOW TEMPERATURE FLEX

Ohopex R-9 is a new plasticizer developed particularly for permanent low temperature flexibility with chloroprene base synthetic rubbers. When aged 7 days @ 121°C. (A. S. T. M. D412-D865) cured stocks containing Ohopex R-9 lose none of their low temperature flexibility.

Uncured stocks containing Ohopex R-9 have long lived building tack and are easily processed. It has little or no effect on curing properties.

In vinyl compounds Ohopex R-9 when used with primary plasticizers (from 10-20% of the total plasticizer) imparts low temperature flexibility, and reduces migration.

OHIO-APEX DIVISION
FOOD MACHINERY & CHEMICALS CORPORATION
NITRO, W. VA.

SEND FOR THE SUPPLEMENT TO OUR TECHNICAL CATALOG WITH COMPLETE INFORMATION CONCERNING OHOPEX R-9.

"For the best in plasticizers"

OHIO APEX inc. PLASTICIZERS & CHEMICALS

NATIONAL FORGE
Compression-Crush TESTING MACHINES
For Rubber and Cushioning Materials

- Dual Loading Range 0-100 lbs. — 0-1000 lbs. A.S.T.M. Accuracy.
- Simple, permanently accurate mechanical weighing.
- Large, easy-to-read eye-level scale.
- Infinitely-variable speed.
- Improved Recorder. Flat stress-strain graph. Start at any preload.

LARGER MACHINES OF 5000 and 10,000-lbs. AVAILABLE

TESTING MACHINE DIVISION

NATIONAL FORGE AND ORDNANCE CO.

Dept. R.A. Irvine, Warren County, Penna.

REVIEWS

BOOKS

Manual for Plastic Welding. (Volume II—Polyethylene). By G. Haim and J. A. Neumann. Industrial Book Co., 1240 Ontario Street, Cleveland 13, Ohio. 5¾ x 8¾ in. 128 pp. $6.00.

At the present time there are two distinct trends in the welding of plastics: gas welding, mainly applied to structural work, and high-frequency welding, mostly used for making up household goods, toys and fancy articles from plasticized PVC sheets. This manual is confined to gas welding of plastics and its applications. It was compiled to give the practical man all the information which he requires to become an efficient welder of plastics. There are a few books dealing with the welding of plastics, but these were written for engineers and research workers and therefore contain much information which is of little use to the practical welder; on the other hand, they do not contain sufficient information for the person who wishes to become a plastic welder. During the past few years, gas welding of plastics has been applied with particular success to a large and ever-increasing variety of constructions where it has proved invaluable. Information on this subject is rather scarce and the authors express the wish that this work will prove of value to practical welders and engineers.

•

Polymer Degradation Mechanisms. (NBS Circular 525). Published by the Office of Scientific Publications, National Bureau of Standards, Washington 25, D. C. 6 x 9 in. 280 pp. $2.25. (Order from Government Printing Office, Washington 25, D. C.)

This book represents the proceedings of a symposium held by the National Bureau of Standards in September, 1951. It points out that research on the durability of polymeric materials is of increasing significance in view of the growing importance of these synthetic products in our national economy and defense. A knowledge of the mechanisms by which polymers degrade is needed in order to predict more accurately their expected service life, to inhibit degradation more effectively, and to devise better methods of accelerated testing. The papers in this volume record the progress that has been made in elucidating the structure of polymers and the mechanisms of their break-down. The papers were presented by scientists throughout the world; a record of the discussion that followed each paper is also given. The volume summarizes much of the work carried out on the mechanisms of polymer degradation in the past decade.

•

The Theory of Polymerization. (Student Manual No. 1). By H. Ronald Fleck. Published by Temple Press, Ltd., Bowling Green Lane, London, E.C. 1, England. 5¾ x 8¾ in. 145 pp. $1.50.

The purpose of the present series of volumes, of which this volume is the first, is to endeavor to explain in relatively simple language the basic chemical and physical laws and processes underlying the manufacture of plastics materials. The book has been designed primarily for those who work in the plastics industry, but it will also be of interest to those who are concerned merely with the ultimate use of its products. The theory of polymerization is at once the most difficult and most fundamental aspect of the chemistry of plastics, but the author has not assumed too great a knowledge of chemistry on the part of the student. The apprentice who wishes to know something of the materials with which he works should find in this book an explanation which he can understand and appreciate. Not only has the theoretical aspect been thoroughly explained, but suitable samples and laboratory exercises are given, together with calculations.

BOOKLETS, CATALOGS, etc.

Compounding Silicone Rubber With Dow Corning Gum. Dow Corning Corp., Midland, Mich. 9 x 11½ in. 30 pp.

The properties of rubber compounds made with a silicone gum base are materially affected by the amount and type of fillers, additives, and vulcanizing agent used, and the length of cure given to the fabricated part. In like manner, certain precautions should be followed in compounding and handling silicone rubber to assure attaining the optimum in the properties sought. This publication, therefore, presents compounding information based on the findings of the company's Product Development Group in compounding for specific applications. It is intended to serve as a guide in making silicone rubber to meet specific requirements. Detailed information on compounding silicone rubber with Dow Corning 400 Gum is given under sections on fillers, vulcanizing agents, additives, and methods of compounding and equipment. This information is supplemented by graphs which illustrate the effect of filler loading, length of cure, and amount of vulcanizing agents and special additives on the properties of the compounded silicone rubber.

•

Industrial Gas Trucks with Fluid Coupling. (Y-1250). Yale Materials Handling Division, Yale and Towne Manufacturing Co., 11,000 Roosevelt Boulevard, Philadelphia 15, Penna. 8½ x 11 in. 8 pp.

This brochure describes and pictures the new G-52 series of gasoline fork lift trucks. Completely new in design, the G-52 series points the way toward fork lift truck design of the future —smaller, more powerful, more maneuverable, more efficient and more versatile models, the publication points out. Among the features described in the brochure are a fluid coupling which has been built into the flywheel as an integral part of the unit to reduce overhang and over-all length, and a specially designed muffler that produces a cooler running engine. Also described is a hypoid gear drive with four pinion differential. Many other features are highlighted by the use of cutaway photographs and diagrams that depict the new design features. A page is devoted to picturing and describing typical Yale attachments that increase truck "workability" by doing a variety of handling jobs.

•

Vertical Triplex Single Acting Plunger Pumps. (W-414-B45). Worthington Corp., Harrison, N. J. 8½ x 11 in. 12 pp.

This new bulletin on vertical triplex, single action plunger pumps is graphically illustrated by photographs, charts, line drawings, etc. The bulletin contains information about features, applications, ratings, dimensions and specifications of the VTE, VTE-1 and VTE-2 types of Worthington plunger pumps. Designed for application in many fields including the petroleum industry, water flooding and salt water disposal, hydraulic press systems, and hydraulic descaling systems, the plunger pumps offer such features as interchangeable plunger sizes; individual valve covers; flanged suction and discharge openings stuffing box drains; complete automatic oiling system; straight-through liquid flow; close-clearance liquid end; and synchronous suction valve unloaders, supplied as optional equipment.

•

High Pressure Pumps. Sprague Engineering and Sales Corp., 1144 West 135th Street, Gardena, Calif. 8½ x 11 in. 4 pp.

This bulletin describes the Model S-216-C series of air-driven, high pressure, hydraulic pumps produced by the company. The bulletin lists eight models with discharge pressures from 1,100 to 33,500 psi and describes the operation of the units in high pressure, low-volume service such as hydrostatic testing, hydraulic presses and other hydraulic machines for clamping, riveting, crimping, shearing and punching. The bulletin is illustrated with line drawings and photographs. Accessories available are also discussed.

Now Available

Annual Report on the Progress of Rubber Technology for 1953

(Volume XVII)

(Prepared by the Institution of the Rubber Industry)

A valuable addition to the library of all those engaged or interested in the rubber industry. No less than 24 outstanding specialists in the rubber industry have contributed sections devoted to particular technological phases. A reading of the following subject listing will indicate the scope of this latest edition:

- Historical and Statistical Review
- Planting and Production of Raw Rubber, Latex, Gutta Percha and Other Related Products
- Properties, Applications and Utilization of Latex
- Chemistry and Physics of Raw Rubber
- Synthetic Rubber
- Testing and Equipment and Specifications Other Than for Latex
- Compounding Ingredients
- Fibers and Fabrics
- Chemistry and Physics of Vulcanized Rubber
- Tires
- Belting
- Hose and Tubing
- Cable and Electrical Insulation
- Footwear
- Mechanical Rubber Goods
- Games, Sports Accessories, Toys, etc.
- Surgical Goods
- Textile-Rubber Composites, Solvents and Cements
- Cellular Rubber
- Hard Rubber
- Flooring
- Works Processes and Materials
- Machinery and Appliances
- Roads

RUBBER AGE
250 West 57th St.,
New York 19, N. Y.

Please send me ..... copy(ies) of the Annual Report on the Progress of Rubber Technology (Volume XVII) @ $3.50 each.*

——Remittance Enclosed

——Send Invoice

Name .....

Address .....

.....

* Add 3% for N. Y. City addresses

Institution of the Rubber Industry

LONDON

The I.R.I., which was founded in 1921, is now a great association of people engaged in all branches of the Rubber Industry. Its members include rubber producers, manufacturers, scientists, technologists, executives, students and others, in many countries of the world.

It has reached its present position of authority and respect through the high standard it has set for the technical literature it publishes, the diplomas it awards, and the meetings and conferences it organizes.

In collaboration with other Societies, it aims to raise the standing of the Industry throughout the world by improving the technical qualifications of its personnel, extending the study of its raw materials, processes, and products, and by promoting the exchange of technical discovery and information by means of literature, conferences, and meetings.

Membership of the Institution is open to all interested at an annual subscription of $7.50 which entitles the member to receive the bi-monthly Transactions free of charge and to purchase other publications (such as the Annual Reports and Monographs) at reduced rates. It also serves to put him in touch with his colleagues and their work in other parts of the world and confers on him full rights to vote, to nomination for election to the Council and to participate in meetings and Conferences organized by the Institution.

Complete details are easily obtained by writing to:

Secretary,

INSTITUTION OF THE RUBBER INDUSTRY

12, WHITEHALL

LONDON, S.W. 1, ENGLAND

REVIEWS (CONT'D)

Air Conditioning Units for Commercial and Industrial Applications. (C-1100-B33B). Worthington Corp., Harrison, N. J. 8½ x 11 in. 8 pp.

Ceiling-mounted and floor-mounted central station air conditioner units for commercial and industrial applications are the subject of this new bulletin. The publication is graphically illustrated and gives specifications, dimensions, accessories, physical data and features of the AHY (ceiling-mounted) and AVY (floor-mounted) units. Designed for complete year-round air conditioning, the units are sectionally constructed to permit ease in handling, interchangeability and flexibility of assembly. The vertical AVY units are designed in three sections—base section, coil section and fan section. Horizontal AHY unit consists of fan section, coil section and drip pan. Constructed of rugged fabricated steel angles electrically welded and reinforced by a novel gusset design, all sections may be handled and installed independently where desired.

•

Jerguson Gages and Valves. (New Catalog 236). Jerguson Gage and Valve Co., 80 Fellsway, Somerville 45, Mass. 8½ x 11 in. 8 pp.

This catalog covers practically the complete line of liquid level gages and valves produced by the company with a condensed presentation of the most pertinent data and specifications. This condensed catalog is an easy-to-use working tool containing valuable information for the engineer. Included are illustrations of the various standard and special function Jerguson gages and valves, descriptions of features and uses, materials used, steam ratings of gages, dimensional drawings, and a full page table giving standard and optional construction features and specifications.

•

Hydraulic and Pneumatic Controls. (Catalog 4G). Barksdale Valves, 5125 Alcoa Avenue, Los Angeles 58, Calif. 8½ x 11 in. 34 pp.

This manual contains important general information such as a detailed description and illustration of the shear-seal principle and its application in manual and solenoid valves. Pressure switch selection, although seemingly complex, has been put into plain, understandable terms in a selection chart based on users' requirements. The data in this book are indispensable to any engineer concerned with hydraulic or pneumatic control. To locate the volume on a bookshelf or in a file without hunting, an exclusive quick-find tab has been incorporated in the backbone.

•

Design and Deflection in Roll Shafts. (Engineering Data Report No. 3). Industrial Roll Division, Rodney Hunt Machine Co., Orange, Mass. 8½ x 11 in. 2 pp.

Rubber, plastics, textile and paper mill engineers will find value in this latest engineering data report on industrial rolls published by the company. This new report discusses bending and torsion and is the third in a series prepared by the company to assist in the design and selection of rolls for specific plant applications. Three formulas for calculating maximum bending of shaft, maximum stress set up by bending moment, and deflection of shaft between roll and bearing are presented with typical applications.

•

Cleveland Tramrail Engineering and Application Data. (Booklet No. 2008-K). Cleveland Crane and Engineering Co., Wickliffe, Ohio. 8½ x 11 in. 12 pp.

This revised booklet contains the latest information on the line of overhead materials handling equipment offered by the company. Subject material takes in various track drives, cranes, electrification, buckets, grabs, etc. Design features and specifications of many of the units are presented together with an interesting series of photographs showing some of the units at work in various industrial plants. The booklet is also illustrated with several line drawings.

Rubber Chemicals and Paracril. Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn. 6½ x 9½ in. 230 pp.

This book is offered as a quick and ready reference to information on the characteristics and uses of Naugatuck rubber chemicals and the Naugatuck oil-resistant nitrile-type "Paracril" synthetic rubbers. The data, while concise, are intended to be sufficiently complete to allow the compounder to make a quick and accurate appraisal of each product. Chemicals have been arranged in main groups of accelerators, antioxidants and stabilizers, activators and special products. The accelerators have been still further subdivided on the basis of chemical structure. With such an arrangement, the purpose has been to facilitate the problem of choosing that chemical which is best suited to the work at hand. Typical applications and amounts are shown for use both in natural and synthetic rubber. In addition, each grade of the Paracril synthetic rubbers is described individually according to its best intended end use.

•

Oilgeareducers. (Bulletin 56610). Oilgear Co., 1587 C. W. Pierce Street, Milwaukee 4, Wisc. 8½ x 11 in. 8 pp.

"Oilgeareducers"—packaged hydraulic drive output units consisting of the company's constant displacement axial piston motors integral with Falk's complete line of concentric and right-angle all-steel reducers are described in this new bulletin. There are five sizes of hydraulic motors for drives up to 20 hp which are described. Reducers with wide ratio combinations provide maximum output speeds from 1.7 to 1170 rpm. Normal output torques range from 42 lb-in to 41500 lb-in with 1100 psi pressure. Starting and peak torques are 60% higher. Specifications cover complete variable speed drives with and without Oilgeareducers. Typical applications are listed and described. Installation dimensions are also included.

•

Titeflex Quick-Seal Coupling. Titeflex, Inc., Hendee Street, Springfield 4, Mass. 8½ x 11 in. 16 pp.

A quick connect-disconnect hose coupling for water, oil, steam, gas and chemical lines, which provides permanent freedom from leakage, is described in this bulletin. It describes the simple construction of the coupling and points out how this construction provides a unique sealing action which makes the coupling tighter as internal pressure increases, and how it provides a full swiveling action that prevents hose twisting and kinking, thereby assuring long hose life. Also described in this bulletin are single- and double-check valve modifications of this coupling. Coupling accessories, such as right-angle connections and dirt-exclusion covers are also described.

•

Saddle Mounted-Vertically Split Centrifugal Pumps. (W-341-B11B). Worthington Corp., Harrison, N. J. 8½ x 11 in. 8 pp.

This new bulletin on saddle mounted, vertically split centrifugal pumps, describes this heavy duty line which has been designed for continuous duty in all boiler circulation and heater drain service. The bulletin describes methods of construction, coverages available, pressure-temperature limitations, with cross-section drawings of the various types of pumps in the line, together with dimensions and specifications.

•

1,4-Naphthoquinone. (Technical Bulletin I-4). National Aniline Division, Allied Chemical & Dye Corp., 40 Rector Street, New York 6, N. Y. 8½ x 11 in. 4 pp.

1,4-Naphthoquinone, which is gaining importance in the manufacture of synthetic rubber, polyester resins, fungicidal sprays and many other chemical syntheses, is the topic of this folder. It lists the physical properties of 1,4-Naphthoquinone and illustrates its chemical properties by structural equations. Sixteen literature references are included.

RCMA
RAY-BRAND
CENTRIFUGED LATEX
RUBBER RC CORPORATION OF AMERICA
• Normal Latex
• GR-S Latex Concentrate
• Natural and Synthetic Latex Compounds
• Plastisols
RC PLASTICIZERS
E-S (An Epoxidized Triester)
DIOP (Di-Iso-Octyl Phthalate)
ODP (Iso-Octyl Iso-Decyl Phthalate)
O-16 (Iso-Octyl Palmitate)
TG-8 (Triethylene Glycol Dicaprylate)
TG-9 (Triethylene Glycol Dipelargonate)
DOP (Di-2 Ethylhexyl Phthalate)
DOA (Di-2 Ethylhexyl Adipate)
DIOA (Di-Iso-Octyl Adipate)
DOS (Di-2 Ethylhexyl Sebacate)
DIOS (Di-Iso-Octyl Sebacate)
DBP (Dibutyl Phthalate)
We maintain a fully equipped laboratory and free consulting service.
Rubber Corporation of America
New South Road, Hicksville, New York
SALES OFFICES: 111 West Monroe Street, Chicago 3, Ill.
Little Building, 80 Boylston St., Boston 16, Mass.
2076 Romig Road, Akron, Ohio

25th anniversary
IMPORTERS & COMPOUNDERS
natural and synthetic
RUBBER LATEX
VULTEX •
BUNA N
PLASTISOLS
RESIN EMULSIONS
— LATEX COMPOUNDS
GENERAL LATEX & CHEMICAL CORP.
666 Main St., Cambridge 39, Mass.
GENERAL LATEX & CHEMICAL CO. (OF GEORGIA)
1206 Lamar St., Dalton, Georgia
GENERAL LATEX & CHEMICALS (CANADA) LTD.
Verdun Industrial Bldg., Verdun, Montreal, Que.
SALES REPRESENTATIVES IN PRINCIPAL CITIES
Exclusive Agents for sale in USA of
Harrisons & Crosfield Malayan Latex

MARKETS

NEWS-PRICES

NEW YORK, AUG. 2, 1954

Natural Rubber

Since our last report (July 6), the average price of spot rubber on the New York Commodity Exchange has moved in a range of 75 points, high for the period being 24.50c reached on July 7 and again on July 8, and low being 23.75c reached on July 29 and 30. The average price of spot rubber for the month of July was 24.12c based on 21 trading days. This compares with 23.01c in the previous month.

According to the trade, the mystery of recent months has been the absence of real selling pressure from Indonesia. Local prices in Indonesia have been quoted materially above those prevailing in world markets. Of course, fair quantities have been shipped against licenses to dollar areas, but the normal pressure from Indonesia has been conspicuous by its absence for a considerable time.

Leading trade factors with important contacts in Indonesia find no evidence of any excessive accumulation of stocks. Thereby hangs a mystery as to what is happening to the Indonesian rubber. As a matter of fact, any number in the trade here have been reluctant to follow the price advance in rubber being apprehensive over possible devaluation of the rupiah and a sudden splurge of selling by Indonesia to the U.S. markets.

Richardson Surveys Market

"Consumption of natural rubber in the United States will decline if the present market price for this material maintains or goes higher," according to a recent statement by W. S. Richardson, president of the B. F. Goodrich Co. The current competitive situation between natural rubber and the principal general purpose synthetic rubber—GR-S—in this country is such that, for a wide range of uses, economic considerations will influence the choice of materials. When natural rubber prices are higher than GR-S prices, as is now true, manufacturers will of necessity consider the lower-cost man-made material, Mr. Richardson said.

The result will be that the U.S.A. industry will not consume this year as large a quantity of natural rubber as previously had been predicted by the industry statisticians. In April of this year, it was estimated that about 620,000 long tons of natural rubber would be used in the United States in 1954, or slightly more than half of the total estimated new rubber consumption of 1,235,000 tons. This substantial increase over the 553,000 tons consumed in 1953 appeared probable in view of the lower prices for natural rubber which had prevailed during the preceding six months.

But if the anticipated lower prices are not realized, said Mr. Richardson, American manufacturers undoubtedly will revise their forward schedules so that the quantity of natural rubber which will be used during the last half of this year will be lower than previously planned and consumption during the early part of next year will also decline.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM JULY 7 TO AUGUST 1

July	Spot	Sept.	Dec.	Mar.	May	Sales
7	24.50	24.75	25.10	25.25	25.52	149
8	24.50	24.70	24.95	25.10	25.30	69
9	24.00	24.30	24.65	24.80	25.00	102
10	....	....	....	....	....	....
11	....	....	....	....	....	....
12	24.25	24.80	25.20	25.40	25.55	82
13	24.38	24.70	25.05	25.25	25.35	101
14	24.12	24.35	24.70	24.90	25.00	32
15	24.00	24.30	24.70	24.80	24.90	180
16	24.00	24.50	24.73	24.95	25.05	16
17	....	....	....	....	....	....
18	....	....	....	....	....	....
19	23.88	24.15	24.51	24.76	24.89	30
20	23.88	24.05	24.36	24.51	24.61	141
21	24.12	24.40	24.70	24.80	24.90	73
22	24.25	24.50	24.75	24.85	25.00	76
23	24.00	24.00	24.55	24.65	24.60	151
24	....	....	....	....	....	....
25	....	....	....	....	....	....
26	24.25	24.50	24.85	25.00	25.05	131
27	24.12	24.50	24.85	24.90	25.00	45
28	23.88	24.00	24.45	24.50	24.65	84
29	23.75	23.70	24.15	24.25	24.30	87
30	23.34	24.00	24.17	24.25	24.30	40
31	....	....	....	....	....	....
Aug. 1	....	....	....	....	....	....

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.23¾
August	.23¾
September	.23¾
Thin Latex Crepe:	
Spot	.23⅝
Thin Brown Crepe, No. 2	.24¼
Smoked Blankets	——
Flat Bark Crepe	.19¾

London Market

(Standard Smoked Sheets)

Sept.	24.06 - 24.21
Oct.-Dec.	24.06 - 24.21

Singapore Market

(Standard Smoked Sheets)

September	22.59 - 22.71

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	2.50 -3.60
G-E Silicone Gum (not compounded)	4.00 -4.20
GR-I	—— - .230
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type Q	—— -1.00
Neoprene Type S	—— - .420
Neoprene Type W	—— - .410
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Silastic (compounded)	1.95 - .338
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	July 6 Close	August 2— High	August 2— Low	August 2— Close
Oct.	33.94	34.42	34.32	34.38
Dec.	34.10	34.61	34.52	34.55
Mar.	34.25	34.71	34.65	34.70

Synthetic Rubber

The Federal Facilities Corporation has announced a profit of $43,000,000 from synthetic rubber production in fiscal 1954. It is interesting to note that these profits are after all expenses were deducted with the one exception of federal taxes.

This report should bear close study on the part of rubber producing interests. Generally, the trade believes that the cost of any government operation, with few exceptions, is higher than the cost to an efficient private manufacturer. It may be argued that the cost of raw materials which are obtained by the government for synthetic rubber production may probably be less than to private enterprise. This is open to debate.

It is not too many months ago that renegotiations were taking place between the government and suppliers of raw materials. At that time, the suppliers were very insistent that only about 10% of the quantity of the commodities should be involved in re-negotiation as the balance was not intended for government use. This clearly indicated the possibility that private enterprise may have been able to buy raw materials at lower prices than the government. Some also take into consideration that manufacturers for the government may not be cutting every corner to lower expenses. In the long run, lower synthetic rubber prices under private enterprise may well be the case, a majority in the trade believe.

Plans to build a synthetic rubber plant with an output of 30,000 tons per year were recently discussed at a meeting of German rubber industrialists at Baden-Baden. A turnover levy of 1% on the sales proceeds of rubber manufacturers has been "accepted in principle". The levy, amounting to about 15,000,000 marks per year, would assure part of the necessary capital outlay estimated at 164,000,000 marks if crude oil was used as the raw material, and at 130,000,000 marks if American-imported butane was to be used.

Cost of 1 kilo of buna would amount to 2.95 marks. This compares with a price of 2.55 marks per kilo for American synthetic rubber, c.i.f., Hamburg. Consequently, State subsidies would be required. A State-backed guarantee for investors has been promised by the Ministry of Economic Affairs.

Production in United States

The U.S. Department of Commerce reports that in the first five months of this year, 197,058 long tons of GR-S were produced, a drop of 115,321 long tons from production in the first five months of 1953. In the first five months of this year, 201,940 long tons were consumed, compared with the 296,946 long tons consumed in the first five months of the previous year. As of May 31, 1954, there were 131,750 long tons in stocks on hand, against the 100,873 long tons on hand at the end of May, 1953.

The Department also reported that at the end of May, 1954, 25,816 long tons of Butyl had been produced and 29,211 consumed. At the end of the period there were 19,946 tons in stocks on hand. As for neoprene, at the end of May, 28,338 long tons had been produced, 23,326 long tons consumed, and stocks stood at 11,707 long tons. N-type rubbers produced as of May 31, 1954, totaled 8,699 long tons. The Department states that as of May 31, 1,695 long tons had been consumed. Stocks at the end of the period stood at 4,515 long tons.

HOGGSON TOOLS, MOLDS AND DIES
For Rubber Testing & Production

Shown here are but a few of the many types of rubber working equipment available. Please submit your problem.

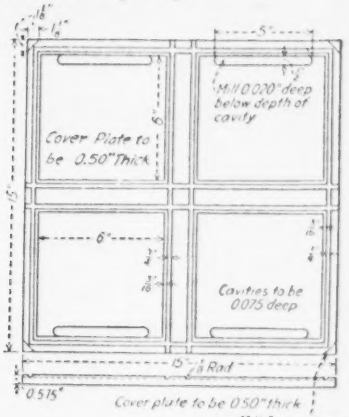
BENCH MARKER

1" and 2" Centers

SHOE STITCHER

PORCUPINE ROLLER

CONCAVE ROLLER

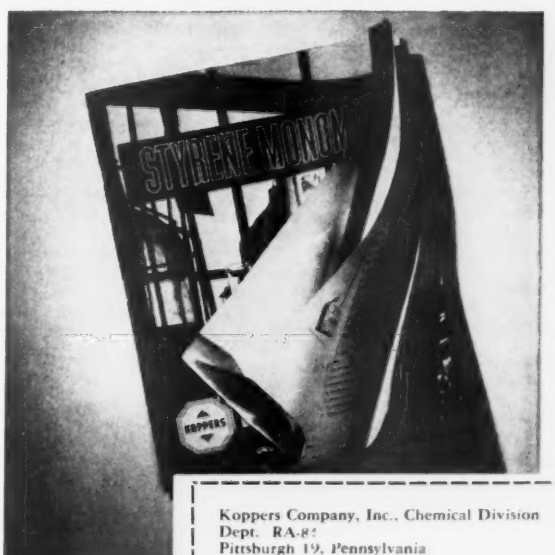

Mill 0.020" deep below depth of cavity
Cover Plate to be 0.50" Thick
6"
Cavities to be 0.075 deep
0.515"
Cover plate to be 0.50" thick
Mill four corners ¼ deep for prying mold apart

(Above)

Standard ASTM and Federal dies for cutting test tensile and tear strength samples, and dies for slab curing carried in stock. Write for catalog.

HOGGSON & PETTIS MANUFACTURING CO. • 141A Brewery St. • NEW HAVEN 7, CONN.

Don't MISS– "THE STYRENE MONOMER STORY"
picture of a chemical giant



● Here is an interesting, comprehensive picture of Styrene Monomer today—its diversified applications, its potentialities—the story of a remarkable chemical that only 20 years ago was a laboratory curiosity.

This well-illustrated booklet goes into detail on the countless commercial uses of Styrene Monomer: *synthetic rubber* for tires, hose, industrial belting, shoe soles and heels and floor tile; *plastic materials* for housewares, toys, radio and refrigerator parts; *styrene co-polymer latices* for paints, paper coatings, and waxes; *polyester resins* for the manufacture of glass fiber reinforced articles such as furniture, storage tanks, boat hulls, and car bodies; *drying oils* and *alkyd resins* for varnishes and enamels; and many, many more products.

Send for your copy of this interesting and informative booklet now—*Free of charge*. Just fill in and mail the coupon below.

KOPPERS COMPANY, INC.
CHEMICAL DIVISION, DEPT. RA-84
PITTSBURGH 19, PENNSYLVANIA

Koppers Company, Inc., Chemical Division
Dept. RA-84
Pittsburgh 19, Pennsylvania

Please send me your booklet on Styrene Monomer.

Name..... Title.....

Company.....

City..... State.....

KOPPERS ®

Koppers Chemicals

SALES OFFICES: NEW YORK · BOSTON · PHILADELPHIA
ATLANTA · CHICAGO · DETROIT · LOS ANGELES

MARKETS

NEWS-PRICES

NEW YORK, AUG. 2, 1954

Reclaimed Rubber

A fair volume of business has been reported by the trade during the past month, notwithstanding the fact that some reclaimers as well as consumers had temporarily curtailed operations for the usual vacation periods. There have not been any price changes during the period.

The U. S. Department of Commerce reports that in the first five months of this year, 123,765 long tons of reclaimed rubber were consumed against the 128,484 long tons consumed in the first five months of the previous year. In the first five months of 1954, 107,401 long tons were produced, compared with the 135,979 long tons produced in the same period of the preceding year.

The Department also reports that in the first five months of this year, exports totaled 4,673 long tons, while in the same period of the prior year, 5,156 long tons were exported.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¾
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.12½
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

Trading in the scrap rubber market during the past few weeks continued the slow pace which has been evident for some time. The current market dullness was attributed to the traditionally slow summer period, when many consumers close down for vacations.

Some in the trade are expecting a general pickup in late August, bringing higher prices and somewhat increased demand. The few sales that were reported were at previously established prices.

The U. S. Department of Commerce reports that 3,247,723 pounds of scrap rubber valued at $79,420 were exported during the month of April. This compares with the 2,111,379 pounds valued at $60,246 exported during the previous month. In February, 2,480,468 pounds valued at $55,116 were exported.

(Prices Delivered Akron)

Mixed tires	ton	13.50
Light colored carcass	lb.	.05½
No. 1 peelings	ton	48.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	18.00
Truck and Bus S.A.G.	ton	17.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.08½
Natural Rubber Black Tubes	lb.	.05½
Butyl Rubber Tubes	lb.	.02½

Tire Fabrics

According to a recent study compiled by the Textile Economics Bureau on textile inter-fiber competition, the rubber industry consumed 652,600,000 pounds of fiber in 1952, with tire cord and fabric accounting for 483,900,000 pounds of this total.

Rayon and nylon tire cord and fabric accounted for 381,800,000 pounds of total fiber consumption in this field, and cotton tire cord and fabric accounted for 102,100,000 pounds.

A total of 88,000,000 pounds of fiber were consumed for hose and belting in 1952, including 63,600,000 pounds of cotton fiber and 24,400,000 pounds of high tenacity rayon and nylon fiber.

Automotive uses consumed 122,500,000 pounds of fiber in 1952, with cotton accounting for 43,000,000 pounds, wool, 25,200,000 pounds, and man-made fibers, 45,900,000 pounds. These automotive uses included convertible automobile tops, carpets, upholstery, and seat or slip covers.

A total of 557,200,000 pounds of cotton fiber, 20,000,000 pounds of wool fiber and 46,500,000 pounds of man-made fiber were consumed for various other industrial uses, including laundry supplies, electrical insulation, bags and bagging, tents, tarpaulins, parachutes, filter fabrics, and abrasive fabrics.

Exports of tire fabric, ducks and cotton cloth totaled 47,242,000 square yards in May, with a valuation of $13,300,000, according to the latest statistics released by the Bureau of the Census. This total shows a sharp decline compared to exports in the preceding month as well as exports in May, 1953.

Total exports in April of this year amounted to 64,206,000 square yards valued at $18,000,000, while a year earlier, exports came to 62,247,000 square yards valued at $16,400,000.

Closing Cordura Plant

As reported elsewhere in this issue, E. I. du Pont de Nemours & Co., Inc., announced on July 6 that it plans to discontinue all rayon operations at its Buffalo, N. Y., plant. The schedule calls for the discontinuance of "Cordura" rayon yarn production in September of this year and termination of the rayon staple operation by April of 1955.

Production of Cordura yarn was started at the Buffalo plant on a temporary basis during World War II to meet emergency needs. Reversion to normal civilian demands led the company to decide to consolidate production at its tire yarn plant at Richmond, Va. The company stated that operation of the staple plant is no longer economical as a result of the competitive situation and the lower priced staple being imported.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73

Nylon Tire Cord

210	lb.	2.00
840	lb.	2.00

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½

Cotton Chafers

14.4 oz. (per square yard)	lb.	.74
9.25 oz. (per square yard)	lb.	.69½
11.65 oz. (per square yard)	lb.	.66
8.9 oz. (per square yard)	lb.	.71

Liquid Latex

Natural: According to Latex & Rubber, Inc., there has been a general leveling of past imbalances in Hevea latex during July. Previously, there were distressed spots caused by late ship arrivals and unexpected consumption requirements. There are now small inventories available in importer's hands and factories appear comfortably stocked.

Current strikes in the rubber industry will cause latex to build up in stocks. The length of the strikes will determine whether or not portions of this latex will come into the open market. Other strikes, now threatening, if engaged, will also cause stocks to grow larger. During the past period Hevea latex in bulk lots, East Coast, has ranged from 33¼ to 36c per pound total dry solids.

Synthetic: According to the U. S. Department of Commerce, 20,033 long tons of GR-S latex were produced in the United States in the first five months of this year. Consumption in the same period ran to 18,293 long tons, while 5,290 long tons were in stocks on hand at the end of May.

The Department states that 3,526 long tons of neoprene were produced through May of this year. Consumption during that time ran to 3,008 long tons. Stocks on hand at the end of the period totaled 1,133 long tons.

As for the acrylonitrile latices, the Department advised that in the first five months of 1954, 2,413 long tons were produced and 1,525 long tons consumed. Stocks as of May 31 totaled 646 long tons, the Department reported.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in the rather narrow range of 35 points since our last report (July 6), high for the period being 35.55c reached on July 19, and low being 35.20c reached on July 7 and again on July 9. The average price of middling uplands for the month of July was 35.37c based on 21 trading days. This compares with an average of 35.17c in the previous month.

Legislation to stimulate the use of export credit for cotton and other domestic industries has been passed by the House of Representatives and the Senate and sent to the White House. The bill will increase the lending authority of the Export-Import Bank of Washington from $4,500,000,000 to $5,000,000,000, and will maintain this agency's independent status. During hearings on this legislation, cotton industry witnesses and others urged its passage so that more export credit would be made available to stimulate the export trade.

The Department of Agriculture has added Greenville, S. C., and Greenwood, Miss., to the list of bona fide spot cotton markets designated under cotton futures legislation. Department officials said that the number of active traders and the volume of spot cotton business in the Greenville and Greenwood markets, fully justify their designation as bona fide spot markets at this time. Both these markets have organized cotton exchanges which have made arrangements to furnish cotton price quotations to the Department. These exchanges have made formal application for the designation as bona fide spot cotton markets.

VULCARITES

DISPERSIONS OF RUBBER CHEMICALS
for
NATURAL AND SYNTHETIC LATEX COMPOUNDING

•

"VULCARITE" denotes individual or composite ball-milled dispersions of zinc oxide, sulfur, antioxidants and accelerators.

"VULCARITE" also signifies the most exacting and rigid quality control according to your specifications.

•

Our sales and technical staffs are at your disposal.

ALCO OIL & CHEMICAL CORPORATION

TRENTON AVE. and WILLIAM ST., PHILADELPHIA 34, PA.

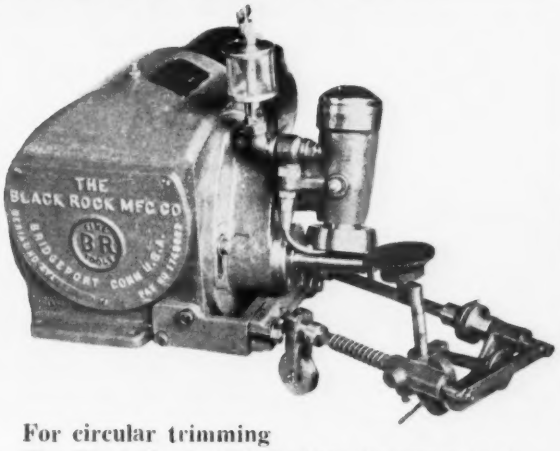
NEW ENGLAND OFFICE:
Alco Oil & Chemical Corp.
610 Industrial Trust Building
Providence 3, R. I.

WEST COAST REPRESENTATIVE:
H. M. Royal, Inc.
Warehouse, 4814 Loma Vista Ave.
Los Angeles 58, Cal.

IMPROVE YOUR TRIMMING PRODUCTION
. . . With a BLACK ROCK 4TA

For flat trimming

- Cutters are self-sharpening
- Mechanism completely enclosed.
- Unit driven by an integral 1/6 H.P. Motor.
- Ball bearing mounted.



For circular trimming

The Black Rock 4TA Rubber Trimmer is the most compact, sturdy . . . yet flexible machine made. Designed for accurate and rapid work, it trims flat as well as circular pieces and possesses many exclusive features.

WRITE TODAY FOR BULLETIN #19-A.

FINE BR TOOLS

BLACK ROCK MFG. CO.

175 Osborne Street Bridgeport 5, Conn.

N. Y. Office, 261 Broadway

CURRENT MARKET PRICES

of rubber chemicals and compounding ingredients

AUGUST 2, 1954

Prices are, in general, f.o.b. works and cover the domestic markets only. Export prices, as a rule, are usually slightly higher, due to packing regulations, special handling, etc.

Abbreviations: bbls., barrels; c.l., carlot; cyl., cylinder; dlvd., delivered; dms., drums; eqld., equalized; l.c.l, less than carlot; M.B., masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

*For Export Only

The arrangement of this section closely follows the Chemical Section of the 1953-54 RUBBER RED BOOK. Readers are referred to the RUBBER RED BOOK for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)	lb.	.50	.57
A-32	lb.	.66	.80
A-100	lb.	.52	.66
Accelerator No. 8	lb.	—	1.10
Accelerator—49	lb.	.53	.54
Accelerator—552	lb.	—	2.25
Accelerator—808	lb.	.66	.68
Accelerator—833	lb.	1.17	1.19
Accelerator B	lb.	—	.89
Altax	lb.	.48	.50
Ancap *	lb.	.38	.40
Ancatax *	lb.	.48	.50
Ancazate * BU (ET & ME)	lb.	—	1.04
Ancazide * ET	lb.	—	1.04
ME	lb.	—	1.14
Arazate	lb.	—	2.25
Beutene	lb.	.66	.68
Bismate, Rodform	lb.	—	3.00
Butasan	lb.	—	1.04
Butazate	lb.	—	1.04
Butyl Accelerator 21	lb.	—	.89
Butyl Eight	lb.	1.10	1.35
Captax	lb.	.38	.40
C-P-B	lb.	—	1.95
Cumate, Rodform	lb.	—	1.45
Dibenzo G-M-F	lb.	—	2.60
Diorthotolylguanidine	lb.	.57	.58
Diphenylguanidine	lb.	.48	.55
El-Sixty	lb.	.50	.57
Ethasan	lb.	—	1.04
Ethazate	lb.	—	1.04
Ethyl Thurad	lb.	—	1.04
Ethyl Tuex	lb.	—	1.04
Ethylac	lb.	.93	.95
G-M-F	lb.	—	2.60
Guantal	lb.	.57	.64
Harvex	lb.	.62	.68
Hepteen	lb.	.44	.46
Base	lb.	—	1.85
Kure-Blend MT	lb.	—	.70
Ledate, Rodform	lb.	—	1.04
MBT-XXX	lb.	.49	.51
Merac	gal.	.75	1.05
Mercaptobenzothiazole	lb.	.38	.40
Mercaptobenzothiazyl Disulfide	lb.	.48	.50
Mertax	lb.	.49	.56
Methasan	lb.	—	1.04
Methazate	lb.	—	1.04
Monex	lb.	—	1.14
Mono Thurad	lb.	—	1.14
Morfex	lb.	.65	.67
2-MT	lb.	—	1.00
NA-22 (for neoprene)	lb.	—	1.50
NOBS No. 1	lb.	.69	.71
Special	lb.	.79	.81
O-X-A-F	lb.	.49	.51
Pentex	lb.	—	1.04
Flour	lb.	—	.21
Permalux (for neoprene)	lb.	—	2.17
Phenex	lb.	.52	.57
Pip-Pip	lb.	—	2.25
Polyac	lb.	—	1.65
R-2 Crystals	lb.	—	4.35
Rorax	lb.	.49	.51
RZ-50	lb.	—	1.00
B	lb.	—	1.00
SA-52	lb.	—	1.14
SA-57	lb.	—	1.04
SA-62	lb.	—	1.04
SA-66	lb.	—	2.60
SA-67	lb.	—	1.04
SA-77	lb.	—	1.04
Santocure	lb.	.69	.76
Selenac (Ethyl, Methyl)	lb.	—	2.60
Setsit-5	lb.	.75	1.05
SPDX-GH	lb.	.64	.69
GL	lb.	—	.95
Tellurac	lb.	—	1.45
Tepidone	lb.	.45	.48
Tetrone A	lb.	—	1.91
Thiofide	lb.	.48	.55
S	lb.	.50	.57
Thionex	lb.	—	1.14
Thiotax	lb.	.38	.43
Thiurad	lb.	—	1.14
Thiuram E	lb.	—	1.04
M	lb.	—	1.14
Trimene	lb.	.56	.58
Base	lb.	1.03	1.06
Tuads, Ethyl	lb.	—	1.04
Tuads, Methyl	lb.	—	1.14
Tuex	lb.	—	1.14
Ultex	lb.	1.00	1.10
Unads	lb.	—	1.14
Vulcacure NB	lb.	—	.45
ZB	lb.	—	.85
ZE	lb.	—	.85
ZM	lb.	—	.85
Z-B-X	lb.	—	2.45
Zenite	lb.	.48	.50
A	lb.	.57	.59
Zenite Special	lb.	.49	.51
Zetax (uncoated)	lb.	.49	.51
Zimate, Butyl	lb.	—	1.04
Zimate, Ethyl	lb.	—	1.04
Zimate, Methyl	lb.	—	1.04

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.14¾	.15¾
Fish Oil, Hydrogenated, Fatty Acid			
DAR-S (dlvd.)	lb.	.09	.10¾
DAR-HY (dlvd.)	lb.	.11½	.13¼
Hydrofol Acids (dlvd.)	lb.	.11¼	.16
Hyfac 430 (dlvd.)	lb.	.14¾	.16½
Neo-Fat H.F.O. (dlvd.)	lb.	.14½	.15¾
Neutrax (dlvd.)	lb.	.12¾	.14
Stearex Beads (dlvd.)	lb.	.09¾	.10¾
Talene (dlvd.)	lb.	.11½	.13¼
Lime, Hydrated			
Arrowhead	ton	—	20.50
Marblehead	ton	—	16.00
Sierra	ton	—	22.00
Litharge			
Eagle-Picher	lb.		.16
SB (dlvd.)	lb.	—	.15
Magnesium Oxide, Heavy			
General Magnesite 500	lb.	.05	.06½
600	lb.	.06	.08
Michigan No. 15	lb.	.06	.06½
Permanente	lb.	.05	.06½
Magnesium Oxide, Light			
Baker's (Neoprene Grade)	lb.	—	.31
General Magnesite (Neoprene Grade)	lb.	—	.30
General Magnesite No. 101	lb.	.21½	.22½
Genmag ML	lb.	—	.25
195	lb.	—	.20½
K & M (Neoprene Grade)	lb.	.30	.31

ACTIVATORS (Cont'd)

Magnesium Oxide, Light (cont'd)			
Maglite D	lb.	—	.25
M	lb.	—	.31
Marine's (Neoprene Grade) (l.c.l.)	lb.	—	.30
Michigan No. 30	lb.	—	.25
No. 40 Extra Light	lb.	—	.31
Witco Extra Light	lb.	.32	.35
Oleic Acid			
Emersol 210 (dlvd.)	lb.	.14¾	.16½
L.C.P. Red Oil	lb.	.14¾	.16½
Neo-Fat 90-14	lb.	—	.14
92-04	lb.	.16¾	.18½
Palm Oil Fatty Acid (c.l.)	lb.	.10½	.14
Potassium Oleate (dms.)	lb.	.45	.55
Red Lead			
Eagle-Picher	lb.	—	.17
No. 2 RM (dlvd.)	lb.	—	.17
Sodium Laurate, 75%	lb.	.64	.74
Sodium Oleate, 75%	lb.	.45	.55
Paste (dms.)	lb.	—	.20
Sodium Stearate, 75%	lb.	.45	.55
USP Grade (drums)	lb.	—	.37
Stearic Acid, Single Pressed			
Emersol 110 (dlvd.)	lb.	.11¾	.13½
Groco 53	lb.	.11¾	.13½
Neo-Fat 18-53	lb.	.13	.13¾
Standard Pearlstearic (dlvd.)	lb.	.11¾	.13½
Wochem 730	lb.	.08¼	.09
Stearex B (dlvd.)	lb.	.15½	.16¼
Stearic Acid, Double Pressed			
Choice Pearlstearic (dlvd.)	lb.	.12¾	.14
Emersol 120 (dlvd.)	lb.	.12¾	.14
Groco 54	lb.	.12¾	.14
Neo-Fat 18-54	lb.	.13½	.14½
Wochem 731	lb.	.12¾	.13
Stearic Acid, Other			
Extra Pearlstearic (dlvd.)	lb.	.14½	.16½
Neo-Fat 1-58	lb.	.1190	.1315
1-60	lb.	.1400	.1525
1-65	lb.	.1450	.1575
Wochem 732	lb.	.14½	.15¼
White Lead Basic Carbonate	lb.	.16½	.17½
White Lead Basic Sulfate	lb.	.14¾	.15¾
Zinc Laurate			
Laurex	lb.	.32	.33
Zinc Stearate	lb.	.39	.42
Aquazinc	lb.	.26	.35

Unclassified Activators

Actifat (dms.)	lb.	—	.18
Actogen	lb.	—	.62
Aktone	lb.	.22	.23
Barak	lb.	—	.62
Curade	lb.	.57	.59
D-B-A	lb.	—	1.95
Dibutylamine (dlvd.)	lb.	.55	.56
MODX	tons	.32½	.34½
Ridacto (drums)	lb.	.25	.26
Smolotte (dlvd.)	lb.	.16½	.18¼
Vulklor	lb.	.75	.85

ANTI-COAGULANTS

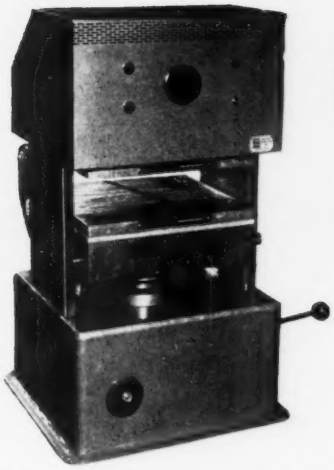
Anhydrous Ammonia (l.c.l.)	lb.	.17	.21
Aqua Ammonia (dms.)	lb.	.031	.035
M.B.M. (l.c.l.)	lb.	—	.35

ANTI-FOAMING AGENTS

Aero Anti Foam H	lb.	—	.20
Regular	lb.	—	.12
D.C. Antifoam A	lb.	5.45	6.65
Antifoam A Emulsion	lb.	2.05	4.00
Antifoam AF Emulsion	lb.	2.05	2.85
Defoama W-1701	lb.	—	.12½
Defoamer A-25	lb.	—	3.00
Defoamer 630	lb.	—	.12½
Deltyl Prime	lb.	.70	.80
Emcol IM	lb.	—	.60
Kessco X-3 (dms.)	lb.	—	.35½
Nopco 1407	lb.	.20	.20½
1497-V	lb.	.13¾	.14¾
1907-B	lb.	.18¾	.19¾
JMK	lb.	.48½	.49
RS-968	lb.	.38	.38½
SS-24 Silicone Anti-Foam	lb.	5.80	6.90
66	lb.	5.70	6.20
Terpinol Prime No. 1	lb.	.35	.50

ANTIOXIDANTS

Agebest 1293-22A	lb.	1.90	2.00
Agerite Alba	lb.	2.35	2.45
Gel	lb.	.64	.66
Hipar	lb.	.98	1.00
H. P.	lb.	.72	.74



THE

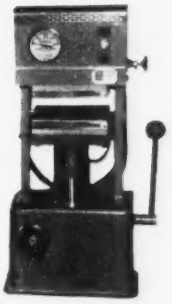
P·H·I

PRESS*

a new

"JUMBO"

model



Meeting industry-wide demands, PHI now presents the 60-ton H Type "Jumbo" Model with 18" x 18" platens. Ram: 6¾". *Stroke:* 4½". Hydraulic Pump: *Manual, Air or Electric.* Temperature Control: *To 600°, including cooling.* Modifications to suit customer requirements. Write for detailed circular.

*formerly PRECO

20-ton model

P·H·I PRESS

PASADENA HYDRAULICS, INC.

277 N. Hill Ave., Pasadena 4, California

"WINDSOR CLAY"

A superior quality *HARD* rubber makers' clay we are mining and refining near Aiken, South Carolina. Available in compressed 50-lb. papers, palletized if desired. Exhaustive tests show this clay to have

- **high tensile**
- **excellent tear resistance**
- **ph - 5.1**
- **uniformly high color**

We welcome the opportunity to submit a sample together with Technical Data.

UNITED CLAY MINES CORPORATION
TRENTON NEW JERSEY

Miners of FINE CLAYS *for 47 years*

TRENDEX DIVISION

OF

THE HUMKO CO.

1702 N. THOMAS ST. MEMPHIS 1, TENN.

Announces the Appointment

of

THE C. P. HALL COMPANY OF ILLINOIS

5145 West 67th St., Chicago 38, Illinois

As Exclusive Sales Agents in the
17 midwestern states served by them
on sales of FATTY ACIDS to the rubber industry.

ANTIOXIDANTS (Cont'd)

Agerite Powder	lb.	.52	.54
Resin	lb.	.75	.77
Resin D	lb.	.52	.54
Spar	lb.	.52	.54
Stalite	lb.	.52	.54
Stalite S	lb.	.52	.54
White	lb.	1.45	1.55
Akroflex C	lb.	.77	.79
CD	lb.	.72	.74
Aminox	lb.	.52	.54
Antioxidant 2246	lb.	1.65	1.68
Antox	lb.	.52	.54
Aranox	lb.	——	3.25
Benzoquinone	lb.	1.50	1.75
Betanox Special	lb.	.80	.82
B-L-E	lb.	.52	.54
B-X-A	lb.	.52	.54
Deenax	lb.	.95	1.05
Di-tert-Butyl-para-Cresol	lb.	.91	.95
Eugenol C-95%	lb.	2.30	2.50
Flectol H	lb.	.52	.59
Flexamine	lb.	.72	.74
Neozone A	lb.	.56	.58
C	lb.	——	.80
D	lb.	.52	.54
Octamine	lb.	.52	.54
Oxidex	lb.	——	3.60
PDA-10	lb.	.39	.41
Permalux	lb.	——	2.17
Polygard	lb.	.52	.54
Santoflex AW	lb.	.78	.85
B	lb.	.52	.59
BX	lb.	.63	.70
35	lb.	.72	.79
Santovar-A	lb.	1.50	1.57
Santowhite Crystals	lb.	1.60	1.67
Santowhite L	lb.	.52	.59
MK	lb.	1.29	1.36
Santowhite Powder	lb.	1.60	1.67
Sequestrene AA	lb.	——	.97½
NA2	lb.	——	.79½
NA3	lb.	——	.77½
Stabilite	lb.	.55	.57
Alba	lb.	.72	.77
L	lb.	.60	.62
White	lb.	.53	.55
White Powder	lb.	.41	.43
Stabilizer No. 1	lb.	1.55	1.80
Stabilizer No. 9-A	lb.	.80	1.05
Styphen I	lb.	.51	.55
Sunolite	lb.	.21	.23
Tannic Acid, Tech.	lb.	.46	.48
Thermoflex A	lb.	.98	1.00
V-G-B	lb.	.70	.72
Wing-Stay S	lb.	.51	.52

ANTI-SCORCHING AGENTS

Armeen HT	lb.	.31	.33
Benzoic Acid—Tech.	lb.	——	.43
Good-rite Vultrol	lb.	.62	.64
Harcopol 1183	lb.	.70	.74
Sodium Acetate 60-62% Crystals	lb.	.08	.08½

ANTISEPTICS AND GERMICIDES

Arquad S	lb.	.24	.26
Formaldehyde (dms.)	lb.	.066	.071
G-4 (bbls.)	lb.	1.04	1.19
G-11	lb.	2.20	2.30
Nuodex 100 S.S. (dlvd.)	lb.	——	1.10
Nuodex 100 W.D. (dlvd.)	lb.	——	1.25
Nuodex Zinc 8% (dms.) (dlvd.)	lb.	.24	.28
Ortho Cresol (26°-27°)	lb.	——	.201
Preventol GD	lb.	——	1.04
I	lb.	——	.80
Retarder D	lb.	.42	.50
Soligen Drier—Copper 8% (dms.)	lb.	.20¼	.21½
Zinc 8% (dms.)	lb.	.22¼	.23½
Vancide	lb.	——	.80

ANTI-WEBBING AGENTS (for Latex)

DC 7 Compound	lb.	5.13	6.50
Welmix 34	lb.	1.50	2.25

AROMATICS (DEODORANTS)

Airkem 115	gal.	——	6.50
122	gal.	——	6.50
186	gal.	——	6.50
Alamask AA	lb.	——	3.00
AF	lb.	——	2.50
AO	lb.	——	1.50
AR	lb.	——	.50
BG	lb.	——	.15
BGM	lb.	——	.60
CY	lb.	——	2.40
DJ	lb.	——	3.35
DL	lb.	——	1.95
H	lb.	——	5.50
LD	lb.	——	.75
ND	lb.	——	2.75
O	lb.	——	6.50
OS	lb.	——	5.25
Bouquet 149	lb.	——	3.00
Coumarin	lb.	2.95	3.00
Curodex 19	lb.	4.75	4.90
188	lb.	5.75	5.90
198	lb.	6.75	6.90
Deodorant 65	lb.	——	1.85

AROMATICS (Cont'd)

Deodorant L-37	lb.	2.00	2.40
L-44	lb.	2.50	2.90
N.L.T.X.	lb.	1.85	2.15
Deodorant Oil GD 3427	lb.	1.70	2.00
GD 6422	lb.	2.00	2.50
GD 6423	lb.	1.60	1.90
GD 6575	lb.	2.40	2.90
GD 31063	lb.	2.25	2.75
Latex Perfume 5	lb.	——	3.25
6	lb.	——	7.50
9	lb.	——	.65
Naugaromes (dms.)	lb.	.60	3.00
Neutroleum Delta	lb.	——	2.60
Gamma	lb.	——	3.60
Parador A	lb.	2.00	2.50
C	lb.	2.75	3.25
E	lb.	.25	.55
GD 5280	lb.	2.00	2.50
GD 5348	lb.	1.90	3.25
Perfume Oil Bouquet			
Vanilla M	lb.	2.40	2.75
Rodo No. 0	lb.	4.00	4.50
No. 10	lb.	5.00	5.50
Rubbarome (dms.)	lb.	.60	3.80
Rubber Perfume 12	lb.	——	2.85
Russian Leather 7	lb.	——	4.35
Vanillin	lb.	3.00	3.25

BLOWING AGENTS

Ammonium Bicarbonate	cwt.	——	8.00
Blowing Agent CP-975	lb.	.32	.35
Celogen	lb.	——	1.95
AZ	lb.	1.94	1.95
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	——	2.30
Sponge Paste	lb.	——	.20
Unicel	lb.	——	.90
ND	lb.	——	.76
S	lb	——	.20
Urea	lb.	.04¼	.04¾

BONDING AGENTS

Braze	gal.	6.00	9.00
Cover Cement	gal.	2.50	4.00
Durez 12987	lb.	——	.54
Kalabond	gal.	6.50	7.75
MDI (dms.)	lb.	3.45	3.75
50 (dms.)	lb.	1.85	2.15
Penacolite B1A	lb.	——	.95
R-2710	lb.	——	.95
Pliobond 20	gal.	2.91	4.23
30	gal.	3.65	4.97
Rex Compounds	gal.	1.30	2.85
TDI (dms.)	lb.	2.00	2.30
Thixons	gal.	3.30	9.00
Ty-Ply Q (BN & S)	gal.	6.75	8.00
Tygobond 30	gal.	5.50	7.45

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	9.00	11.00
Glacial 99½% (dms.)	lb.	.12	.13
Calcium Nitrate, Tech. Crystals	lb.	.07	.11½
Hydroxyacetic Acid—70% (dms.)	lb.	——	.084
Zinc Nitrate, Tech.	lb.	——	.22½

COLORING AGENTS

Black

Aquablak B (also M, R)	lb.	.09¼	.09¾
Aquablak S	lb.	.11½	.12
Black Shield 4-35 (dms.)	lb.	——	.09
Carbon Black—*See Reinforcing Agents*			
Lampblack No. 10	lb.	.06	.09
Mapico Black Iron Oxide (50 lb. bags)	lb.	.12¾	.13
Pure Black Iron Oxide	cwt.	12.75	13.00

Blue

Cooke M.B. Blue	lb.	2.45	2.85
Muori Blue	lb.	——	.48
Monastral Rubber Blue CPL	lb.	——	1.77
PCD, Dispersed	lb.	——	2.20
Peacoline Blue	lb.	——	3.85
Ramapo Blue	lb.	——	3.00
Rubber Blue GD (Disp.)	lb.	——	4.55
Rubber Blue X-1999	lb.	——	1.70
Syntheline Blue	lb.	——	3.85
Stan-Tone MBS	lb.	1.55	4.55
GPE	lb.	——	2.50
PC	lb.	——	2.40
PDS	lb.	——	2.00
PVC	lb.	——	3.25
Ultramarine	lb.	.14	.30
Vansul Blue M.B.	lb.	.90	2.60

Brown

Brown Iron Oxide	lb.	.13¾	.14
Mapico Brown (50 lb. bags)	lb.	.13¾	.14
Stan-Tone GPE	lb.	——	3.00
Vansul Brown M.B. (Organic)	lb.	——	2.10

COLORING AGENTS (Cont'd)

Green

Cooke M.B. Green	lb.	1.45	3.20
Filo Green	lb.	——	.32
Green Chromium Oxide, Pure	lb.	——	.39¾
Green Chromium Oxide, Pure Hydrated	lb.	——	1.10
Monastral Rubber Green GSD (Dispersed)	lb.	——	2.80
GSL	lb.	——	1.97
Permansa Green CP-594	lb.	——	1.35
Pigment Green B	lb.	——	1.35
GL-652D	lb.	.80	.90
Ramapo Green	lb.	——	3.50
Rubber Green FD (disp.)	lb.	——	2.05
Rubber Green X-1292	lb.	——	1.30
Stan-Tone MBS	lb.	1.75	3.60
GPE	lb.	——	3.00
PC	lb.	——	3.00
PDS	lb.	1.90	2.20
PVC	lb.	——	3.60
Vansul Green M.B.	lb.	1.00	3.05

Maroon

Stan-Tone MBS	lb.	——	3.50
Vansul Maroon M.B.	lb.	——	3.25

Orange

Molybdate Orange	lb.	——	.44
Rubber Orange OD (Disp.)	lb.	——	2.75
Rubber Orange X-2065	lb.	——	3.00
Stan-Tone GPE	lb.	——	1.20
PC	lb.	——	1.05
PDS	lb.	——	1.20
PVC	lb.	——	2.25
Vansul Orange M.B.	lb.	2.00	2.50

Red

Antimony Trisulfide	lb.	.72	.78
R. M. P. Sulfur Free	lb.	——	.78
R. M. P. No. 3	lb.	——	.72
Cadmium Red	lb.	.95	1.25
Cadmolith Red (bbls.)	lb.	1.75	2.00
Cooke M.B. Red	lb.	.95	3.15
Graphic Red (dlvd.)	lb.	——	.79
Indian Red, American, Pure	lb.	.12¾	.13
Doxco (English)	lb.	.11½	.11¾
Kroma Reds	lb.	.16¼	.21¼
Mapico Reds (50 lb. bags)	lb.	.12¾	.13
Oximony Iron Oxide	lb.	——	.09
Recco Red Oxide	lb.	.12	.13
Red Iron Oxide, Light	lb.	.13	.13½
Rubber Red PBD (disp.)	lb.	——	1.75
2BD, Dispersed	lb.	——	1.80
2BL	lb.	——	1.47
PBL	lb.	——	1.65
Rubanox Red CP-762 (dlvd.)	lb.	——	1.40
Rubber Red CP-339 (dlvd.)	lb.	——	1.10
Rubber Red X-1148	lb.	——	.79
Solfast Red	lb.	1.50	1.95
Stan-Tone MBS	lb.	1.20	4.00
GPE	lb.	1.65	2.00
PC	lb.	1.45	2.40
PDS	lb.	1.40	1.55
PVC	lb.	——	2.00
Sun Burnt Red	lb.	.11½	.11¾
Vansul Red M.B.	lb.	1.20	3.20
Watchung Red	lb.	1.63	1.95

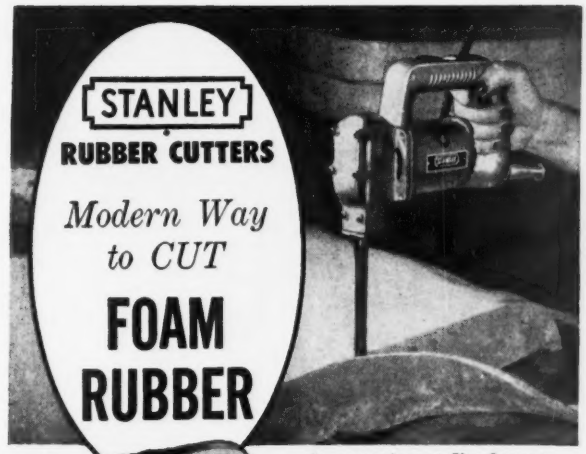
White—Lithopone

Albalith	lb.	.0750	.0850
Eagle-Picher	lb.	.0750	.0825
Permolith	lb.	.0750	.0825
Sunolith	lb.	.0750	.0825

White—Titanium Pigments

Ti-Cal	lb.	.08⅜	.09⅛
R-25, R-22, R-27, R-30	lb.	.08⅜	.08⅞
R-60	lb.	.08⅝	.09⅛
Ti-Pure	lb.	.22½	.25½
Anatase grades	lb.	.22½	.23½
Rutile grades	lb.	.24½	.25½
Titanox A—all grades (dlvd.)	lb.	.22½	.23½
C-50 (dlvd.)	lb.	.12⅞	.13⅜
RA (dlvd.)	lb.	.24½	.25½
RA-10 (dlvd.)	lb.	.24½	.25½
RA-NC (dlvd.)	lb.	.24½	.25½
RC (dlvd.)	lb.	.08⅝	.09⅛
RC-HT (dlvd.)	lb.	.08⅜	.08⅞
Unitane O-220	lb.	.19½	.20½
OR-250	lb.	.21½	.22½
Zopaque	lb.	.22½	.23½
R	lb.	.24½	.25½

STANLEY
RUBBER CUTTERS
Modern Way to CUT
FOAM RUBBER



NOS. 994-996

In operation at The Sponge Rubber Co., Inc., Shelton, Conn.

No Pinch • No Waste

Cuts Even • Cuts Quicker

Operator can follow template or any marked pattern. Cuts straight lines, curves or angles at up to 30 ft. a minute. For further information write, 426 Myrtle St., New Britain, Conn.

STANLEY *Electric Tools*

HARDWARE • TOOLS • STEEL STRAPPING • STEEL

WANTED

ADHESIVE PROBLEMS

Our Laboratories are anxious to work on adhesive problems others have failed to solve.

We have developed adhesives for

Plastic	Glass	Fibreglass
Fabric	Pliofilm	Plywood
Tinfoil	Brakes	Polythene
Leather	Metal	Cellophane
Rubber	Cork	Concrete

and many other materials.

Write us if you have an adhesive problem. Samples will be submitted without charge.

ADHESIVE PRODUCTS
CORPORATION
1660 BOONE AVE. · NEW YORK, N.Y.
ESTABLISHED 1895

DRAPEX 3.2

LOW TEMPERATURE EPOXY PLASTICIZER

EXCELLENT *low* TEMPERATURE FLEXIBILITY AT *low* COST

At a fraction of the cost, Drapex 3.2 gives your vinyls low temperature flexibility properties equivalent to dioctyl sebacate. Its low volatility and low specific gravity (.905 at 20 C.) are additional economy features.

In addition, Drapex 3.2, because of its epoxy content, offers excellent stability . . . high heat resistance, low extractability, and resistance to water and sunlight.

LOW VISCOSITY PLASTISOLS USING 25% *less* PLASTICIZER

Tests indicate that a plasticizer consisting of two-thirds dioctyl phthalate and one-third Drapex 3.2 gives the plastisol formulation the same viscosity as when dioctyl phthalate is used alone . . . but, requires 25% less plasticizer. By using Drapex 3.2, you use less plasticizer to get the same viscosity, and at the same time, obtain a wider range of flexibility.

These 2 big advantages of Drapex 3.2 will improve the quality of your products while saving money. Why not find out how Drapex 3.2 can work for you. *Write today for Technical Bulletin 4, a working sample, and the low price of Drapex 3.2.*

"PURR-FECTION"

ARGUS CHEMICAL CORPORATION
633 COURT STREET BROOKLYN 31, N. Y.

COLORING AGENTS (Cont'd)

White—Zinc Oxide (American Process)

AZO-ZZZ 11 (and 22, 33, 44, 55)	lb.	.1350 -	.1450
Eagle Picher AAA	lb.	.1350 -	.1450
Horse Head Special	lb.	.1350 -	.1450
XX	lb.	.1350 -	.1450
Protox 166	lb.	.1350 -	.1450
167	lb.	.1350 -	.1450
St. Joe Black Label	lb.	.1350 -	.1450
Green Label	lb.	.1350 -	.1450
Red Label	lb.	.1350 -	.1450

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	— -	13

White—Zinc Oxide (French Process)

Florence Green Seal	lb.	.1525 -	.1625
Red Seal	lb.	.1475 -	.1575
White Seal	lb.	.1575 -	.1675
Kadox 25	lb.	.1575 -	.1675
Kadox 15, 17 and 72	lb.	.1450 -	.1450
Protox 168	lb.	.1750 -	.1450
169	lb.	.1350 -	.1450
U.S.P. (cartons)	lb.	.1675 -	.1775

White—Zinc Sulfide

Cryptone ZS	lb.	.2530 -	.2630

Yellow

Benzidine Yellow	lb.	2.50 -	3.50
Cadmolith Yellow (bbls.)	lb.	— -	1.15
Chrome Yellow	lb.	— -	.31
Cooke M.B. Yellow 405	lb.	— -	1.70
Iron Oxide, Pure	lb.	.10½ -	.10¾
Mapico Yellow (50 lb. bags)	lb.	.10¾ -	.10¾
Rubber Yellow GD (disp.)	lb.	— -	2.15
GL	lb.	— -	1.80
Rubber Yellow X-1940	lb.	— -	2.15
Stan-Tone MBS	lb.	1.30 -	4.50
GPE	lb.	— -	4.50
PC	lb.	.85 -	4.50
PDS	lb.	1.25 -	1.75
PVC	lb.	— -	1.60
Toluidine Yellow YL-660 D	lb.	1.15 -	1.20
Oximony Iron Oxide	lb.	— -	.06¾
Vansul Yellow M.B.	lb.	.95 -	1.95
Zinc Yellow	lb.	.25 -	.30

DISPERSING AGENTS

Anchoid*	lb.	.24 -	.25
Armeen 18	lb.	.38 -	.40
Blancol	lb.	— -	.15¾
Darvan No. 1 (and No. 2)	lb.	.22 -	.30
Daxad 11 (21, 23)	lb.	.08 -	.30
Diethanolomine (dms., dlvd.)	lb.	.27½ -	.30¾
Dispersaid	lb.	1.25 -	1.35
Emcol K-8300 (dms.)	lb.	.19 -	.20
Emulphor ON-870	lb.	— -	.61
Furala	lb.	.06½ -	.07½
Halloid	lb.	.04½ -	.05½
Igepal CO-630	lb.	— -	.36
Igepon T-73	lb.	— -	.29½
Leonil SA	lb.	— -	.55
Lomar PW	lb.	— -	.18
Marasperse C	lb.	.06½ -	.06¾
CB	lb.	.12¼ -	.13¼
N	lb.	.09½ -	.10½
Monoethanolomine (dms., dlvd.)	lb.	.28 -	.30¾
Nekal BA-75	lb.	— -	.40
BX-76	lb.	— -	.64
Nopco 1187-X	lb.	.15¾ -	.16¾
Rubbex	lb.	.267 -	.285
Stablex B	lb.	.50 -	.95
Stan-Chem BQC	lb.	.12¼ -	.17¼
1067	lb.	— -	.13½
1471	lb.	.1687 -	.2187
2251	lb.	.12¼ -	.17¼
Trenamine D-25	lb.	.32½ -	.36
Triethanolamine (drums) (dlvd.)	lb.	.24½ -	.27¼
Yelkin TT	lb.	.13 -	.17
Zinsper	lb.	— -	.15

EXTENDERS

Advagum 1098	lb.	— -	.64
Arcco 1071-13B	lb.	.14½ -	.15½
1073-18B	lb.	.13½ -	.14½
1294-36B	lb.	.11½ -	.12½
Bunaweld Polymer No. 780	lb.	— -	.22
No. 5514	lb.	— -	.35
Car-Bel-Ex-A and B	lb.	— -	.14
Extender 600	lb.	— -	.1765
Millex	lb.	— -	.07
W	lb.	— -	.07
Nopco 2271	lb.	.15½ -	.16½
Polyco 418	lb.	.17 -	.18
PR-162 Latex Extender	gal.	— -	1.55
Synprolac	lb.	.16 -	.23
Synprowax	lb.	— -	.23
Vistanex	lb.	— -	.45

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite	lb.	.20 -	1.33
Lionite	lb.	.14½ -	1.25
Pumice	lb.	.03 -	.05
Aluminum Hydrate	lb.	.07 -	.10
Aluminum Silicate			
Aluminum Flake	ton	23.50 -	30.00
Marter White	ton	18.50 -	30.00
Barium Carbonate (l.c.l.)	ton	95.50 -	100.00
Barytes			
No. 1 Floated, White	ton	41.35 -	60.10
No. 2 Floated, Unbleached	ton	39.35 -	58.10
No. 22 Barytes (c.l.)	ton	— -	25.00
No. 3805 Barytes	ton	21.25 -	26.75
Foam A	ton	— -	41.35
XIOR	ton	75.00 -	80.00
Bentonite (c.l.)	ton	— -	13.50
Argosite Clay (c.l.)	ton	— -	12.50
Bennett Clay (c.l.)	ton	— -	32.50
SPV Volclay (c.l.)	ton	— -	12.50
White Hi-Gel	ton	— -	65.90
Blanc Fixe	ton	72.50 -	120.00
Calcium Carbonate			
Atomite (c.l.)	ton	— -	30.00
B.I. White No. 1 (c.l.)	ton	— -	8.00
B.I. White No. 2 (c.l.)	ton	— -	7.50
B.I. White No. 390	ton	— -	6.25
Blue Star XX	ton	— -	15.50
Calcene NC	ton	72.50 -	92.50
TM	ton	75.00 -	95.00
Calwhite	ton	— -	17.00
Camel-Carb	ton	— -	10.00
Camel-Tex	ton	— -	18.00
Camel-Wite	ton	— -	30.00
Duramite	ton	— -	15.00
Gamaco	ton	— -	30.00
Kalite	ton	50.00 -	65.00
Keystone White	ton	— -	16.00
Laminar	ton	— -	30.00
Lesamite (c.l.)	ton	— -	27.50
Lorite	ton	30.00 -	35.00
Millical	ton	35.00 -	50.00
Multifex	ton	140.00 -	155.00
MM	ton	110.00 -	125.00
Non-Fer-Al	ton	30.00 -	45.00
Purecal M	ton	56.75 -	80.75
SC	ton	110.00 -	125.00
T	ton	110.00 -	125.00
U	ton	120.00 -	135.00
Rambo No. 1	ton	— -	8.50
Sierracal	ton	15.00 -	18.50
Snowflake	ton	17.00 -	18.00
Super Multifex	ton	160.00 -	175.00
Surfex	ton	35.00 -	50.00
Suspenso	ton	33.00 -	48.00
Witcarb Reg.	ton	56.75 -	80.75
P	ton	110.00 -	125.00
R	ton	120.00 -	135.00
RC	ton	110.00 -	125.00
York White	ton	— -	9.50
Calcium Silicate			
Silene EF	ton	120.00 -	140.00
Calcium Sulfate, Anhydrous			
Snow White Filler	ton	— -	20.50
Calcium Sulfate, Hydrous			
Terra Alba No. 1	ton	12.00 -	14.40
Chalk Whiting (l.c.l.)	lb.	.0150 -	.0175
Recco Paris Whiting	ton	— -	33.00
Clay			
Aiken Clay	ton	— -	14.00
Alsilite (c.l.)	ton	20.00 -	45.00
Alsite (c.l.)	ton	— -	14.00
Aluminum Flake	ton	23.50 -	30.00
Buca (c.l.)	ton	— -	45.00
Burgess No. 20	ton	— -	35.00
No. 30	ton	— -	37.00
Burgess Iceberg	ton	— -	50.00
Catalpo (c.l.)	ton	— -	35.00
Champion	ton	— -	14.00
C.S.D. (c.l.)	ton	— -	13.50
Crown	ton	— -	14.00
Dixie (c.l.)	ton	— -	14.00
Franklin Clay (c.l.)	ton	— -	13.50
Harwick Clays	ton	18.50 -	57.00
Hi-White R	ton	— -	13.50
Kaolloid Clay (c.l.)	ton	— -	10.50
LGB	ton	— -	17.00
LGP	ton	— -	19.00
McNamee (c.l.)	ton	— -	13.50
Paragon	ton	— -	13.50
Pigment 5	ton	23.50 -	26.50
Pigment 33	ton	— -	37.00
Recco (c.l.)	ton	— -	14.00
Sewanee Clay	ton	— -	12.50
Snobrite	ton	— -	12.50
Suprex	ton	— -	14.00
Whitetex (c.l.)	ton	— -	50.00
Windsor Clay (c.l.)	ton	— -	14.00
Diatomaceous Earth	ton	30.00 -	50.00
Kaylorite (c.l.)	ton	— -	30.00
Lorite	ton	— -	30.00
Flock			
Cotton, white and colored	lb.	.11 -	.28
Filfloc F 40-9000	lb.	— -	.13
Filfloc F 6000	lb.	— -	.36
Polycel	ton	110.00 -	210.00
Rayon, bleached or dyed	lb.	.82 -	1.25
Rayon, grey	lb.	— -	.18
Rayon, pink	lb.	— -	.18
Solka-Floc (l.c.l.)	lb.	.07 -	.16
Glue Bone (dlvd.)	lb.	.18 -	.20½
Leather, Shredded	lb.	.05 -	.17
Lignin	lb.	.06 -	.08
Polyfon	lb.	.08 -	.09

FILLERS (Cont'd)

Limestone, Pulverized	ton	3.00 -	4.75
Asbestol Superfine	ton	— -	30.00
Georgia Marble No. 10	ton	— -	10.00
Industrial Filler No. 100 ton		— -	5.75
Micro Velva A	ton	49.00 -	51.00
Micro Velva L	ton	57.00 -	59.00
Magnesium Carbonate	lb.	.0950 -	.1050
K & M Clearcarb	lb.	.1225 -	.1275
Magnesium Oxide	lb.	.05 -	.06
Magnesium Silicate (see Talc)			
Mica	lb.	.01¾ -	.07½
Concord	lb.	.07½ -	.08¼
Micro-Mica	lb.	.07½ -	.08¼
Mineralite (c.l.)	ton	30.00 -	85.00
Silversheen	lb.	.07½ -	.08¼
Triple A Mica (c.l.)	ton	— -	25.00
Vermiculite	lb.	— -	.11
Wet Ground Biotite Mica	lb.	.06 -	.06¾
Wet Ground Mica No. 160	lb.	.07½ -	.08¼
Pyrophyllite			
No. 261	ton	— -	11.50
Pyrax A (c.l.)	ton	— -	13.50
WA (c.l.)	ton	— -	16.00
Sawdust, Graded	ton	14.00 -	35.00
Silica	ton	16.00 -	27.00
Blue Star	ton	— -	20.60
Slate, Powdered (l.c.l.)	ton	15.00 -	20.00
Lo-Micron Slate Flour	lb.	— -	.04½
No. 133 Slate Flour	ton	— -	4.55
Sodium Silico Aluminate Zeolex 23	ton	120.00 -	140.00
Talc (Magnesium Silicate)			
Asbestol Regular	ton	— -	25.00
Blue Star	ton	— -	23.00
French	ton	— -	59.00
L. S. Silver	ton	29.25 -	34.25
No. 367	ton	— -	13.00
No. 1600	ton	— -	70.60
No. 1768	ton	— -	13.00
Nytal 200	ton	— -	25.00
300	ton	— -	36.00
Sierra White	ton	25.75 -	30.75
Soapstone	ton	— -	13.00
Walnut Shell Flour	ton	45.00 -	115.00
Stan-Shell	ton	63.00 -	126.00
Whiting, Commercial	ton	— -	7.00
Camel-Carb	ton	— -	10.00
C-C-O White	ton	— -	19.00
Georgia Marble No. 15	ton	— -	15.00
No. 16	ton	— -	16.00
Keystone (c.l.)	ton	— -	16.00
Snowflake (c.l.)	ton	17.00 -	18.00
Stan-White 325	ton	8.50 -	11.10
Veroc (c.l.)	ton	— -	8.50
Welco (c.l.)	ton	— -	8.50
York White R (c.l.)	ton	— -	8.50
Wood Flour	ton	25.50 -	48.00

FINISHING MATERIALS, SURFACE

Beaco Finishes	gal.	2.10 -	2.35
Black Out	gal.	4.50 -	8.00
Shellac, Orange Gum	lb.	.39 -	.49
VanWax	gal.	1.45 -	1.50

FLAME RETARDANTS

Chlorowax 70	lb.	.18 -	.19
Halowax	lb.	.35½ -	.61¼
Zinc Borate 3167	lb.	.1920 -	.2020
Zyrox	lb.	.76¼ -	.86¼

LATEX MODIFIERS

OPD-101	lb.	— -	.26

LUBRICANTS, MOLD

Akro Gel	lb.	— -	.165
Alipal CO-433	lb.	— -	.21
CO-436	lb.	— -	.27½
Aquadag	lb.	3.50 -	4.00
Aquarex D	lb.	— -	.78
L	lb.	— -	.94
ME	lb.	— -	.94
MDL	lb.	— -	.33
WAQ	lb.	— -	.25
Armid O	lb.	.39 -	.41
Borax, Granular (l.c.l.)	ton	89.00 -	94.00
Carbowax 4000	lb.	.31 -	.32
CD Mold Release A	gal.	— -	7.00
B	gal.	— -	5.00
Colite Concentrate (dms.)	gal.	— -	.90
Concentrex	lb.	— -	.25
Dag Dispersions No. 197	lb.	1.85 -	2.90
D.C. 7 Compound	lb.	5.13 -	6.50
D.C. Emulsion No. 7	lb.	1.59 -	2.07
No. 8	lb.	1.46 -	1.98
No. 35	lb.	1.46 -	3.50
No. 35A	lb.	1.46 -	3.50
No. 35B	lb.	1.46 -	3.50
D.C. Mold Release Fluid	lb.	3.70 -	6.00
Dipex	lb.	.14 -	.18
Dri-Lube	lb.	— -	.23
Glydag G	lb.	1.30 -	2.45
Hawkeye Flake (dlvd.)	lb.	.13¾ -	.14¾
Igepal CO-430	lb.	— -	.39
CO-530	lb.	— -	.36
CO-630	lb.	— -	.36
Igepon AP-78	lb.	— -	.48
T-51	lb.	— -	.13½
Kokobace R	lb.	.18 -	.18½

D P R®

100% SOLIDS

Natural & synthetic rubbers in flowable form.

Also special new grades having superior compatibility with asphalt and polyethylene.

TECHNICAL LABORATORY INFORMATION AND SAMPLES UPON YOUR REQUEST

ORIGINATORS OF QUALITY DEPOLYMERIZED RUBBERS "SINCE 1906"

DPR, INCORPORATED
A Subsidiary of H. V. HARDMAN CO.
571 CORTLANDT STREET
BELLEVILLE 9, N. J.

CROWN CLAY

SOUTHEASTERN CLAY CO.
AIKEN, SOUTH CAROLINA

Sales Agents

HERRON BROS. & MEYER	Akron
HERRON BROS. & MEYER	New York
C. M. BALDWIN	Chicago
ERNEST JACOBY & CO.	Boston
The C. P. HALL CO. of Calif.	Los Angeles
The PIGMENT & CHEMICAL CO. Ltd.	Toronto

Here's another LITTLE FELLOW,
but capable of doing Very Important Work-

the new STEWART BOLLING
Laboratory Spiral-Flow Intensive Mixer

You can entrust to this equipment the most significant tests which lead to intelligent, profitable manufacturing. Capacity — 6 pounds of 1.5 gravity stock. All of Bolling's well-known, successful features: patented Spiral-Flow sides, split end frames, anti-friction bearings, a.c. or d.c. Rounds out a line of outstanding intensive mixers handling up to 475 pounds.

Ask on your letterhead for BULLETIN "A-8"

B STEWART BOLLING & COMPANY, INC.
3194 EAST 65TH STREET • CLEVELAND 27, OHIO

• INTENSIVE MIXERS AND MILLS • CALENDERS • REFINERS • CRACKERS HYDRAULIC PRESSES • PUMP UNITS BALE SLITTERS • SPEED REDUCERS

LUBRICANTS, MOLD (Cont'd)

Linde Silicone L-45	lb.	3.72	4.80
LE-45	lb.	1.46	2.50
Lubrex	**lb.**	**.25**	**.30**
Lubri-Flo	gal.	10.00	12.00
Migralube	**lb.**	**—**	**.35**
Mold Lubricant No. 72			
Conc.	gal.	2.50	4.00
No. 735	gal.	1.26	2.75
No. 769	gal.	1.20	2.60
No. 880	gal.	1.12	2.50
No. 856	gal.	2.00	4.00
No. 935	gal.	1.75	3.25
No. 980	gal.	1.65	3.15
Moldeze No. 3	gal.	5.00	6.00
Mold-Brite	gal.	—	1.50
Mold-White	gal.	—	2.00
Monopole Oil MD	lb.	—	.16
Olate Flakes	lb.	.22¼	.23¼
Orvus WA Paste (dms.)	lb.	—	.23
Polyglycol 15-200	lb.	.25	.28¾
E4000	lb.	.31	.37
Prodag	lb	.29	.42
Purity Flake (dlvd.)	lb.	.17¾	.18¾
Rubber-Flo	gal.	1.25	2.00
Rubber-Glo	**gal.**	**—**	**.94**
Rusco Mold Paste	lb.	—	.25
Sericite (l.c.l.)	**ton**	**65.00**	**75.00**
SF-92 Silicone Fluid	lb.	3.70	4.22
SM-33 Silicone Emulsion	lb.	1.50	1.68
55	lb.	1.46	2.00
61	lb.	1.46	1.68
Thermalube	lb.	—	.13¾
Ucon Lubricants	lb.	.26¾	.27¾
Ulco Mold Soap	lb.	.12	.23

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	.25
Emcol DS-50	lb.	—	.38
RDH-S	lb.	—	.27
Extrud-o-Lube	gal.	—	1.54
G.B. Naphthenic Neutrals	gal.	.11	.18
Ivory Chips	lb.	.18¾	.19¾
Latex-Lube GR (dlvd.)	lb.	19¾	.20
Propylene Stearate (dms.)	lb.	68	.78

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb	.37	.42
Calcium Stearate	lb.	.35	.40
D.C. 4 Compound	lb.	5.13	6.50
D.C. 200 Fluid	lb.	3.70	6.00
Glycerized Lubricant			.18
Glydag B	lb.	1.50	2.10
G	lb.	1.30	2.45
Hydro-Zinc	lb	—	.20
Latex-Lube Pigmented (dlvd.)	lb.	.17¼	.18¼
R-66 (factory)	lb.	—	.16½
Liqui-Lube (dlvd.)	lb.	—	.16¼
N.F. (dlvd.)	lb.	—	.16¾
N.T. (dlvd.)	lb.	—	.16¾
Polyethylene Glycol	lb.	.22	.26
Resayol	lb	—	.12
Rubber Free (Concentrate)	gal.	—	1.44
Jel	lb.	.18	.21½
Separex	lb	—	**.25**
Stock Lube	lb	—	.19
Slab-Dip	lb.	—	.16
Wet-Zinc	lb	—	.22¼
Zinc Stearate	lb.	.37	.42
Z.S.D. Dispersion	lb.	—	.20

MOLD CLEANERS

Actusol (dlvd.)	gal.	1.45	1.65
Alkon (dlvd.)	lb	.16	.16½
Metso Anhydrous	cwt.	4.85	7.10
Metso 99	cwt.	4.50	6.75
Metso 200	cwt.	6.00	6.75
Metso Granular	cwt.	4.00	6.25
Orvus Extra Granules	lb.	.22½	.23½
Rubber-Sol	gal.	2.97	3.97
Sprex A.C. (dlvd.)	lb	17¾	.18¾

PEPTIZING AGENTS

Peptizer P-12	lb.	.95	1.25
Penton 22 Plasticizer	lb.	.79	.82
RPA 2	lb.	—	.78
3	lb.	—	.47
4 Conc.	lb.	—	.97
5	lb.	—	.59
6	lb.	—	1.58

PLASTICIZERS & SOFTENERS

AA (dms.)	lb.	—	.19½
Acto 500	lb	—	.09
Adipol BCA (dms.)	lb.	.47	.47½
2EH	lb.	.44	.47¾
10A	lb.	.44	.47¾
ODY	lb.	.53¾	.54¾
American Pine Tar	lb.	.0410	.0678
Arneel	lb.	.27	.39
Arolene 1980 (c.l.)	lb.	—	.10
Aromatic Plasticizer 10 (and 25) (dms.)	lb.	.06	.06½
Aromatic Tar	gal.	.0573	.1973

PLASTICIZERS & SOFTENERS (Cont'd)

Bardol	lb.	.02¾	.03¾
B	lb.	.06¼	.06½
Bayol D	gal.	—	.382
F	gal.	—	.52
Beeswax, Bleached	lb.	.70	.75
Yellow Refined	lb.	.57	.62
Bondogen	lb.	.55	.60
B.R.C. No. 20	lb.	.0150	.0175
B.R.H. 2	lb.	.0213	.0351
BRS 700	lb.	.02	.0285
B.R.T. 3	lb.	.0180	.0265
4	lb.	.0250	.0260
7	lb.	.03	.031
B.R.V.	lb.	.0475	.0565
Bunarex Resins	lb.	.06½	.07½
Bunatak All	**lb.**	**.08**	**.09**
U	lb.	—	.17½
No 90	lb.	—	.09
No. 210	lb.	—	.14
Burgundy Pitch	**lb.**	**.0843**	**.0888**
Butac	lb.	.11¾	.12¾
Butoxyethyl Diglycol Carbonate (dms.)	lb.	.40	.41
Butyl Benzyl Sebacate	lb.	.87	.89
Butyl Carbitol Perlargonate (dms.)	lb.	—	.64½
Butyl Cellosolve Perlargonate (dms.)	lb.	—	.68
Butyl Palmitate	lb.	—	.26½
But-1 Stearate (dms.)	lb.	.23	.25
BWH-1	lb.	.16	.17
Cabflex DDA	lb.	.44¾	.47¾
DDP	lb.	.34	.37
Di-BA	lb.	.43¼	.46¼
Di-OA	lb.	.44¾	.47¾
Di-OP	lb.	.34	.37
Di-OZ	lb.	.52	.54¾
ODA	lb.	.44¾	.47¾
ODP	lb.	.34	.37
Cabol 100	lb.	.02	.07
Califlux 510, 550	lb.	.02½	.03¼
G.P.	lb.	.0125	.02
R-100	lb.	.04½	.05¼
TT	lb.	.0170	.0245
Candelilla Wax, Prime	lb.	.74	.77
Capryl Benzyl Sebacate	lb.	.89	.91
Carbowax 4000 (dms.)	lb.	.31	.32
Cardolite 615	lb.	.33¾	.36¾
816	lb.	.25¾	.28¾
Carnauba Wax, Crude	lb.	.82	1.00
Refined	lb.	.84	1.00
Yellow	lb.	1.16	1.30
Castorwax	lb.	—	.26½
Celluflex (dms.)	lb.	.35	.40
112 (t.c., dlvd.)	lb.	—	.33
179-A (t.c., dlvd.)	lb.	—	.33
179-C (t.c., dlvd.)	lb.	—	.33
179-EG (t.c., dlvd.)	lb.	—	.33
DBP (t.c., dlvd.)	lb.	—	.33
DOP (t.c., dlvd.)	lb.	—	.34
TPP (dms. eqld.)	lb.	—	.39
Ceresine Wax	lb.	.14	.26
Chlorowax 40	lb.	.14½	.15½
CTLA Polymer	gal.	.20	.56
Cumar Resins	lb.	.06½	.17
Darex DBP	lb.	.33	.35¾
DOP	lb.	.34	.37
DIOP	lb.	.34	.37
D.B.M.	lb.	.32	.34¾
Degras, Common	lb.	—	.14
Diallyl Phthalate (dms.)	lb.	.47	.52¼
Dibenzyl Sebacate	lb.	.88	.90
Dibutoxethyl Sebacate	lb.	—	.5634
Dibutyl Phthalate	lb.	.33	.35¾
Dibutyl Sebacate	lb.	.68	.74
Dicapryl Adipate	lb.	.43	.45
Dicapryl Phthalate	lb.	.30	.35¾
Dicaprvl Sebacate	lb.	.64	.68½
Di-Carbitol Phthalate (dms.)	lb.	.42	.42½
Dicyclohexyl Phthalate	lb.	.58¼	.59¼
Diethyl Phthalate (t.c.)	lb.	.25	.27¾
Di-2-ethylhexyl Phthalate (t.c.)	lb.	—	.34
Dihexyl Adipate	lb.	.42	.44
Dihexyl Phthalate	lb.	.33	.35
Dihexyl Sebacate	lb.	.64	.70
Diisobutyl Azedate	lb.	—	.47¾
Di-iso-octyl Adipate (dms.)	lb.	.42½	.47¾
Di-iso-octyl Phthalate (t.c.)	lb.	.32	.37
Dimethyl Phthalate (t.c.)	lb.	.27½	.30¼
Dimethyl Sebacate	lb.	1.25	1.27
Dinopol	lb.	.37	.38
Dioctyl Phthalate (dms.)	lb.	.32	.37
Dioctyl Sebacate (dms.)	lb.	.64	.69
D.I.O.P. (dms.)	lb.	.36	.37
Dipolymer Oil	gal.	.33	.48
Dispersing Oil No. 10	lb.	.06	.06¼
Dutrex 6	lb.	—	.02
15E	gal.	—	.10
Elastex 10-P	lb.	.34	.37
50-B	lb.	.27	.30
DCHP	lb.	.59	.60
Emulphor EL-719	lb.	—	.62
Estac	lb.	—	.16
Ethox (dms.)	lb.	.45	.45½
Flexol B-400	lb.	.27	.28
DOP	lb.	.36	.37
TOF	lb.	.47¾	.48¾
3GH	lb.	.45½	.46
3GO	lb.	.54½	.55
4GO	lb.	.35½	.36½
Flexricin P-1	lb.	—	.32
P-4	lb.	—	.31
P-4C	lb.	—	.42½
P-6	lb.	—	.37
P-8	lb.	—	.33

PLASTICIZERS & SOFTENERS (Cont'd)

Fortex (dms.)	lb.	.12½	.14½
Galex W-100	lb.	.15½	.19¾
G. B. Light Process Oil	lb.	.025	.0325
Medium Process Oil	lb.	.03½	.04¼
G. B. Naphthenic Neutrals	gal.	.11	.18
Good-Rite GP233	lb.	.44¾	.47¾
GP261	lb.	.34	.37
Harflex 500 (dms.)	lb.	.31½	.33½
Herron-H.T.	gal.	.16	.27
Herron-Plas	lb.	—	.03¾
Herron-Wax	lb.	.05¼	.06
No. 23	lb.	.08¼	.08¾
No. 24	lb.	.07¼	.07¾
HSC No. 13	lb.	.27	.30
Indonex 632½ (633½, 634½, 637½)	gal.	.11	.17
Kapsol	lb.	.34¼	.35¼
Kenflex	lb.	.18	.27
Kesscoflex 101 (dms.)	lb.	—	.39
102 (dms.)	lb.	—	.32½
103 (dms.)	lb.	—	.41½
104 (dms.)	lb.	—	.48
105 (dms.)	lb.	—	.33¾
106 (dms.)	lb.	—	.35½
108 (dms.)	lb.	—	.37
109 (dms.)	lb.	—	.36¼
KP 23 (dms.)	lb.	.31	.32
90 (dms.)	lb.	.47	.48
140 (dms.)	lb.	.48	.48½
201 (dms.)	lb.	.58¼	.59¼
220 (dms.)	lb.	.33	.34
555 (dms.)	lb.	.33¼	.33¾
Kremol 40	gal.	.36	.46
50	gal.	.39	.49
Kronisol (dms.)	lb.	.35	.35½
Kronitex AA dms.)	lb.	.35	.36
I (dms.)	lb.	.35	.36
Lanolin, Tech. Anhydrous	lb.	—	.28
Lead Oleate	lb.	—	.30½
Lindol (dms., t.c.)	lb.	.33	.36
2-Mercaptoethanol (drums)	lb.	1.25	1.50
Methyl Laurate	lb.	.25	.27
Methyl Oleate	**lb.**	**—**	**.20**
Methyl Stearate (dms.)	lb.	—	.30
Montan Wax, Crude	lb.	.13	.14
Monten Wax	lb.	—	.30½
Morflex	lb.	.32	.69½
MR 2088 (dms.)	lb.	—	.19
Natac	lb.	.11¼	.12¼
Nebony Resins (dms.)	lb.	.04	.04½
Neolene 210 (t.c.)	lb.	—	.16
212 (t.c.)	lb.	—	.14
220 (t.c.)	lb.	—	.15
Nerium	lb.	—	.09
Nevillac Resins (dms.)	lb.	.31	.85
Neville Resins (dms.)	lb.	.12	.18
Nevindene Resins (dms.)	lb.	.15	.18
Nevinol (dms.)	lb.	—	.20
Nuba 1 (and 2) (dms.)	lb.	.05¾	.06¼
3X (dms.)	lb	.07¾	.08¼
15 (and 30) Oil (dms.)	lb.	.36¼	.38
No. 480 Oil Process Resin			.38
Ohopex Q10 (dms.)	lb.	.34	.35
R9 (dms.)	lb.	.37¼	.37¾
Opalwax	lb.	.37	.38
Ortho-Nitrobiphenyl	lb.	.13	.15
Ozokerite Wax No. 64 White	lb.	.26	.27
Yellow	lb.	.24	.25
Palm Oil	lb	—	.11
Paradene Resins (dms.)	lb	.06½	.07½
Para Flux (dms.)	gal.	.1925	.2025
2016 (dms.)	gal.	.22	.23
Para Lube (t.c.l.)	lb.	.046	.048
Parmo	lb.	.06	.13½
Penton 22 Plasticizer	lb.	.79	.82
PG-16	lb.	.38¼	.40
Pine Oil (and 25)			.11½
60 (and 75)	lb.	—	.13
100	lb.	.13	.13½
Piccocizer 30	lb.	.05½	.07
Piccolastic A (and B, C, D, E)	lb.	.28	.29
FT, FHF and FN	lb.	.1815	.1965
T-135	lb.	.22¾	.23¾
Piccolyte S Resins	lb	.1815	.20
Piccopale Resins	lb.	.12	.13
Piccoumaron Resins	lb.	.06½	.18
Pigmentar	lb.	.0389	.0678
Pigmentaroil	lb.	.0394	.0678
Plastac M	lb	—	.09¼
Plasticizer 3286	lb	—	.26¼
Plasticizer 4141	lb.	.56¾	.66¾
Plasticizer ODX	lb.	.31	.37
Plasticizer SC	lb.	.54¼	.56¾
Plasticizer W-3	lb.	.37	.38¾
Plasticizer XP-3	lb.	—	.50
Plastoflex 50	lb.	.34¼	.35¼
55	lb.	.31¾	.32¾
520	lb.	.37½	.38½
VS	lb.	.38¼	.39¼
Plastogen	lb	.07¾	.08
Plastolein 9050 (c.l.)	lb.	.56	.59
9055	lb.	.33	.38
9058	lb.	.52	.55
9250	lb.	.27	.30
9715	lb.	.35	.38
Plastone	lb.	.27	.30
Polycin 783	lb.	—	.24½
Polycizer 162	lb.	.34	.37
332	lb.	.44¾	.47¾
ED	lb.	—	.56¾

SPECIAL INDUSTRIAL
FABRICS
for the
RUBBER INDUSTRY

FLIGHTEX FABRIC
REGISTERED U.S. PAT. OFFICE

• COTTON • DYNEL
• VINYON • ORLON
• GLASS

If you use special industrial fabrics you'll find Flightex a dependable source of supply. Our staff of engineers is at your service to help solve your fabric problems.

Write for Complete Information

FLIGHTEX FABRICS, Inc.
93 Worth Street New York 13, N. Y.

SAVE TIME SAVE MONEY
with INDEPENDENT and NEW ERA DIES

CLICKER-WALKER
PUNCH PRESS and
MAUL HANDLE

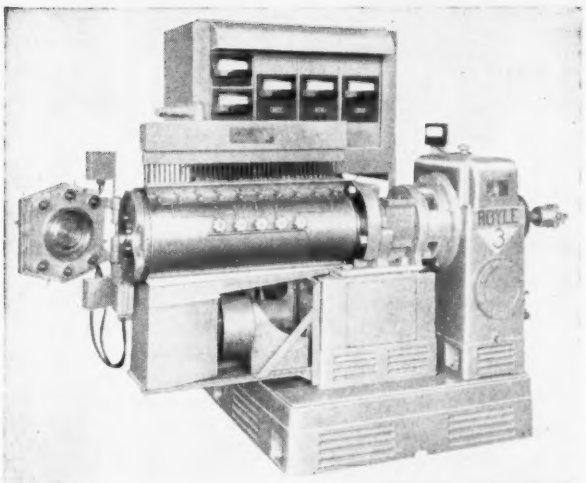
Dies For Every
Conceivable Purpose

DISTRIBUTORS
FOR:

Fales Clicker Machines and Seelye Beam Die Presses. Also Hard Maple and Composition Die Blocks and Pads. Raw Hide Mauls.

INDEPENDENT DIE & SUPPLY COMPANY
2602 LaSalle Place • St. Louis 4, Missouri
ASSOCIATE:
NEW ERA DIE CO. York County, Red Lion, Pa.

FASTEST HEATING FASTEST COOLING



Here are some of the time-tested, money-saving reasons more and more plants are standardizing with Royle Spirod* Extruders for processes requiring maximum flexibility in controlled temperatures — constantly maintained and accurately zoned:

- **Extra heavy walled cast steel cylinders that will not warp. No joints to leak when pressures are high or crevices to collect burned compound that would cause contamination.**
- **Heavy duty large diameter heating elements, that can be used with 440 volts without step-down transformers, provide radiant heat to cylinders and heads.**
- **Any heating element may be removed and replaced without disturbing other elements or wiring.**
- **A cooling system with ten times the capacity of conventional designs can be modulated through its entire temperature range without drastic changes. Ample cooling for all compounds at maximum speeds.**

No. 3 Royle Spirod Extruder. Completely insulated and equipped for evaporative cooling.

*Patent Applied For

JOHN ROYLE & SONS
ROYLE PATERSON N. J. 1880
PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England
James Day (Machinery) Ltd.
REgent 2430

Home Office
V. M. Hovey J. W. VanRiper
SHerwood 2-8262

Akron, Ohio
J. C. Clinefelter
SWandale 4-5020

Los Angeles, Cal.
H. M. Royal, Inc.
LOgan 3261

PATERSON 3, NEW JERSEY

PLASTICIZERS & SOFTENERS (Cont'd)

Polyco 438	lb.	.32	.34
Polymel C-130	lb.	.19½	.20½
D	lb.	.23½	.24½
6	lb.	.05¾	.07¾
Process Oil C-255 (c.l.)	gal.	—	.22
Propylene Stearate (dms.)	lb.	—	.32
PT 67 Light Pine Oil (dms.)	gal.	—	.60
101 Pine Tar Oil (t.c., dms)	gal.	33½	.44½
400 Pine Tar (600, 800) (t.c., dms.)	gal.	.35	.46
PX-104	lb.	.34	.42
PX-108	lb.	.38	.46
PX-208	lb.	.41½	.49
PX-404	lb.	.60	.68
Reogen	lb.	.13¼	.13½
465 Resin (dms.)	lb.	.07	.07½
Resin 731-C	cwt.	—	15.00
Resin C	lb.	.0225	.0310
Resinex	lb.	.03¼	.03¾
L-4	lb.	.02¼	.03
Rexflex	lb.	—	.15
Rosin Oil	gal.	.54	1.20
R.S.O. Softening Oil	lb.	.03	.05
Rubberol	lb.	—	.25¾
Rubtar	gal.	—	.40
Santicizer B-16	lb.	.52	.54¾
E-15	lb.	.51	.53¾
M-17	lb.	.48	.50¾
No. 107	lb.	.38¾	.39¾
No. 140	lb.	.33	.35¾
No. 141	lb.	.37	.39¾
No. 160	lb.	.25	.28
Sherolatum	lb.	.03½	.06
Softener No. 20	gal.	.09	.25
Solarite Resin No. 1	lb.	.16½	.22½
Staflex DBES	lb.	.67½	.68½
DOS	lb.	.68	.69
1XA	lb.	.34	.35
KA	lb.	.37¾	.38¾
Stanolind Petrolatum	lb.	.053	.089
Wax	lb.	.31	.33
Sunny South Burgundy Pitch	lb.	.0980	.1025
Sunny South Pine Tar	lb.	.0389	.0678
Sunny South Rosin Oil	gal.	.58	.87½
Superla Wax	lb.	.34½	.44
Syncera Wax	lb.	.23	.34
Syn Tac (c.l.)	gal.	—	.33
Synthetic Revertant Oil	lb.	—	.16
Tar, Refined	gal.	.12	.17
K-Tarnel NR (t.c.)	lb.	—	.0851
Terpene A	gal.	—	.65
TP-90B	lb.	—	.59
TP-95	lb.	—	.65
Transphalt Resins	lb.	.02¼	.03¾
Triacetin	lb.	.40	.47
Tributyl Phosphate (dms.)	lb.	.52	.53
Tricresyl Phosphate (t.c.)	lb.	.33	.35
Turgum S	lb.	.10	.11
Vanadiset A	lb.	.02½	.07
Vistac No. 1	gal.	1.00	1.21
P	lb.	.18	.18½
Vopcolene 50	lb.	—	.32
Witcizer 100	lb.	.31	.32
200	lb.	.21	.26½
201	lb.	.23½	.29
300	lb.	.35¾	.36¾
312	lb.	.36¾	.37¾
412	lb.	.47¾	.48¾
Witresin—Granular	ton	41.00	43.00
Solid	ton	36.00	38.00

PROCESSING AIDS

Castor Oil, Processed (dms.)	lb.	—	.21½
Refined (dms.)	lb.	—	.19½
Dutrex 7	lb.	.12	.20
ELA	lb.	—	.82
Emcol MAS	lb.	—	.44
Kenflex N	lb.	—	.18
Millrex	lb.	—	.15
Resin No. 510	lb.	.13½	.16½
Zyrox	lb.	.50	.79

PROTECTIVE & STABILIZING AGENTS

Acacia	lb.	.12¾	.21
Alpha Protein	lb.	.24	.28
Ammonium Alginate	lb.	—	1.02
Aroostoocrat	lb.	—	.07½
Carob Bean Flour	lb	—	.46
Casein	lb.	.24	.31
Emcol K-8300 (dms.)	lb.	.19	.20
Ethylene Diamine 68%	lb.	.44	.47
Gum Arabic	lb.	—	.19
Karaya Gum	lb.	—	.25
Locust Bean Gum	lb.	—	.31
Prosein	lb.	.0600	.0630
Rex Compound No. 2801	lb.	—	.15
Stablex B	lb.	.50	.95
K	lb.	.27	.35

RECLAIMING AGENTS

Amalgamator Z-4	—	—	.32
Armeen C	lb.	.45	.47
Mixed Crude	lb.	.17	.23
T	lb.	.29	.31
No. 517 H.B. Oil	gal.	.11½	.16½
535	gal.	.22	.27
Burco RA	lb.	.05½	.08¼
C-6 Oil (and 28, 32)	gal.	.33	.38
C-10 Oil	gal.	.25	.30
C-33	gal.	—	.21½
C-42	gal.	—	.23
Caustic Soda—Flake 76% (c.l., dms.)	cwt.	—	4.10
Liquid 50% (t.c.)	cwt.	—	2.55
Solid 76% (c.l., dms.)	cwt.	—	3.70
Cresylic Acid (99-100%)	gal.	.90	1.23
D-4	gal.	—	.27
E-5	gal.	—	.25
Flake Calcium Chloride (77-80%)	ton	—	27.00
G. B Reclaiming Oil	gal.	.12	.19
CD-10	gal.	.10	.16
CD-50-U	gal.	.18	.24
Gensol No. 6 (t.c.)	gal.	—	.40
Heavy Aromatic Naphtha	gal.	—	.13¼
LX-77 Reclaiming Solvent	gal.	.21	.33
LX-572 Reclaiming Oil	gal.	.27	.32
LX-777 Reclaiming Oil	gal.	.23	.33
Neo-Fat D-242	lb.	.05½	.07¾
PRR 1	gal.	.15	.35
PT 67 Light Pine Oil (dms.)	gal.	—	.60
PT101 Pine Tar Oil (t.c., dms.)	gal.	.33½	.44½
Q Oil	gal.	—	.28
Reclaiming Oil 3186 (t.c.)	gal.	.28	.38½
Reclaiming Oil 3186-G	gal.	.25	.36½
Reclaiming Reagent No. 1431	lb.	.21	.25
R.P.A. No. 3	gal.	—	.47
RR-10	lb.	—	.36
Soda Ash (c.l., bags)	cwt.	—	1.65
Solvent 534	gal.	.20½	.26½
Solvent Oil 21	gal.	.24	.29
C-42	gal.	.23	.28
Union Solvent 4060-O	gal.	—	.184
X-1 Resinous Oil	lb.	.0210	.0275

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98	lb.	.0740	.1225
Continental F	lb.	.0740	.1225
Croflex	lb.	.0740	.1225
Dixiedensed (and S)	lb.	.0740	.1225
HX Compact	lb.	.0740	.1225
Kosmobile (and S)	lb.	.0740	.1225
Micronex HPC	lb.	.0740	.1225
Spheron 4	lb.	.0740	.1225
Witco No. 6	lb.	.0740	.1225

Channel, Medium Processing (MPC) (bags)

Atlantic MPC-95	lb.	.0740	.1225
Collocarb	lb.	.0705	.1105
Continental A	lb.	.0740	.1225
Croflex TH	lb.	.0740	.1225
Dixiedensed HM (and S-66)	lb.	.0740	.1225
Huber Arrow TX	lb.	.0740	.1225
Kosmobile HM (and S-66)	lb.	.0740	.1225
Micronex Standard	lb.	.0740	.1225
Spheron 6	lb.	.0740	.1225
Texas M	lb.	.0740	.1225
Witco No. 1	lb.	.0740	.1225

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42	lb.	.0740	.1225
Collocarb	lb.	.0705	.1105
Continental AA	lb.	.0740	.1225
Croflex 77	lb.	.0740	.1225
Dixiedensed 77	lb.	.0740	.1225
Kosmobile 77	lb.	.0740	.1225
Micronex W-6	lb.	.0740	.1225
Spheron 9	lb.	.0740	.1225
Texas E	lb.	.0740	.1225
Witco No. 12	lb.	.0740	.1225
Wyex	lb.	.0740	.1225

Channel, Conductive (CC) (bags)

Continental R-40	lb.	.2300	.3000
Dixie 5 Dustless	lb.	.1200	.1900
Dixie Voltex	lb.	.2300	.3000
Kosmink Dustless	lb.	.1200	.1900
Kosmos Voltex	lb.	.2300	.3000
Spheron C	lb.	.1400	.1850
Voltex	lb.	.2300	.3000

Conductive Furnace Black (CFB) (bags)

Aromex 115	lb.	.0890	.1290
Shawinigan Acetylene Black	lb.	.1700	.2600
Vulcan C	lb.	.1050	.1500

Furnace, Fast Extruding (FEF) (bags)

Arovel	lb.	.0600	.1000
Collocarb	lb.	.0590	.0990
Continex	lb.	.0650	.1050
Croflex 50	lb.	.0600	.1000
Dixie 50	lb.	.0600	.1000
Kosmos 50	lb.	.0600	.1000
Philblack A	lb.	.0600	.1000
Statex M	lb.	.0600	.1000
Sterling SO	lb.	.0600	.1000

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, General Purpose (GPF) (bags)

Dixie 35	lb.	.0500	.0900
Kosmos 35	lb.	.0500	.0900
Sterling V	lb.	.0500	.0900
V (Non-Staining)	lb.	.0500	.0900

Furnace, High Modulus (HMF) (bags)

Collocarb	lb.	.0470	.0870
Continex HMF	lb.	.0550	.0950
Croflex 40	lb.	.0550	.0950
Dixie 40	lb.	.0550	.0950
Kosmos 40	lb.	.0550	.0950
Modulex	lb.	.0550	.0950
Statex 93	lb.	.0550	.0950
930	lb.	.0470	.0870
Sterling L	lb.	.0550	.0950
LL	lb.	.0550	.0950

Furnace, Semi-Reinforcing (SRF) (bags)

Collocarb	lb.	.0480	.0880
Continex SRF	lb.	.0450	.0850
Croflex 20	lb.	.0450	.0850
Dixie 20	lb.	.0450	.0850
Essex	lb.	.0450	.0850
Furnex	lb.	.0450	.0850
Gastex	lb.	.0500	.0900
Kosmos 20	lb.	.0450	.0850
Pelletex	lb.	.0450	.0850
NS	lb.	.0450	.0850
Sterling NS	lb.	.0450	.0850
Sterling R	lb.	.0500	.0900
Sterling S	lb.	.0450	.0850

Furnace, Fine (FF) (bags)

Statex B	lb.	.0650	.1050
Sterling 99	lb.	.0650	.1050

Furnace, High Abrasion (HAF) (bags)

Aromex	lb.	.0790	.1190
Collocarb	lb.	.0745	.0870
Continex HAF	lb.	.0790	.1250
Croflex 60	lb.	.0790	.1190
Dixie 60	lb.	.0790	.1190
Kosmos 60	lb.	.0790	.1190
Philblack O	lb.	.0790	.1190
Statex R	lb.	.0790	.1250
Vulcan 3	lb.	.0790	.1250

Furnace, Super Abrasion (SAF) (bags)

Aromex 125	lb.	.1100	.1500
Philblack E	lb.	.1350	.1750
Statex 125	lb.	.1050	.1500
Vulcan 9	lb.	.1350	.1780

Furnace, Super Abrasion, Intermediate (ISAF) (bags)

Dixie 70	lb.	.1100	.1550
Kosmos 70	lb.	.1100	.1550
Philblack I	lb.	.1050	.1450
Vulcan 6	lb.	.1050	.1500

Furnace, Super Conductive (SCF) (bags)

Vulcan SC	lb.	.1800	.2230

Thermal, Fine (FT) (bags)

P-33 (c.l.)	lb.	—	.0550
Sterling FT (c.l.)	lb.	—	.0550

Thermal, Medium (MT) (bags)

Shellblack *	lb.	—	.0250
Sterling MT (c.l.)	lb.	—	.0350
MT Non-Staining (c.l.)	lb.	—	.0450
Thermax (c.l.)	lb.	—	.0350
Thermax, Stainless (c.l.)	lb.	—	.0450

REINFORCING AGENTS—SILICA

Cab-o-sil (compressed)	lb.	—	.81
Hi-Sil	lb.	.10	.11½
C	lb.	.11	.12½
Santocel	lb.	.62	.64

REINFORCING AGENTS—MISCELLANEOUS

Angelo Shellac	lb.	.39	.49
Darex Copolymer No. 3	lb.	.47	.49
X34	lb.	.42	.44
43G	lb.	.42	.44
Darex Copolymer Latex No. 3-L (and X34L)	lb.	.36½	.39
Durez 12687 (and 12707)	lb	—	.37
Durez 13355	lb.	—	.29½
Good-Rite Resin 50	lb.	.42	.44
Hetro	lb.	.31½	.32½
Kralac A	lb.	.43	.44

THE SEAL OF DEPENDABILITY

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also to our hydrocarbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

Oldest and Largest Manufacturers of "Factice" Brand Vulcanized Oil Since 1900

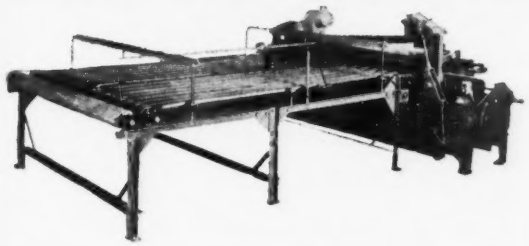
(Reg. U.S. Pat. Off.)

THE STAMFORD RUBBER SUPPLY COMPANY

Stamford, Conn.

ALFA AUTOMATIC STOCK CUTTER....

ACCURATE, CLEAN, SQUARE CUTS



Designed to efficiently handle most cutting problems, the Alfa Stock Cutter is extensively used throughout the Rubber, Plastic and Textile industries—for cutting such materials as: tiling and soling stock, foam, sponge and sheet rubber, cotton battings, sisal fibre glass and insulation. This highly versatile cutter can be used in continuous production line systems, or as a single unit for feed from a parent roll.

We invite your inquiries. Whatever the cutting problem may be —we have standard or special designs to meet most requirements.

SPADONE MACHINE CO. INC.

10 EAST 43rd STREET, NEW YORK 17, NEW YORK

Volume IX

THE CHEMICAL FORMULARY

Editor-in-Chief, H. BENNETT

648 Pages • 5½ x 8½ • $7.50

This new volume is a collection of up-to-date formulae compiled by the country's leading industrial and research chemists. An entirely new book, complete in every detail, each formula is new and different. All of the formulae are the result of long years of research and experiments.

No important industry has been overlooked. No matter how simple or complex a problem may be, this book will enable the solving of it easily and quickly. The chapter on rubber, resins, plastics and waxes contains many new and helpful formulae, many of which have never before been revealed. Get your copy today.

Order from

THE RUBBER AGE

250 West 57th Street New York 19, N. Y.

The French Rubber Journal

REVUE GENERALE DU CAOUTCHOUC

42, rue Scheffer. Paris 16. France

Monthly Magazine established in 1924

Deals with all that concerns rubber. Up to date on every problem of the day. Also monthly French and Foreign rubber bibliography.

Subscription rate: 2700 Francs a year

Price per copy: 300 Francs

Free sample copy on request

REINFORCING AGENTS—MISC (Cont'd)

Lampblack	lb.	—	.12
Marlon S and S-1	lb.	.42	.49
8000	lb.	.42	.49
Marmix	lb.	.42	.49
Pliolite Latex 150	lb.	.44	.45
Pliolite Resin-Rubber Masterbatches	lb.	.35	.50
Pliolite NR	lb.	.94	.95
Pliolite S3, S6, and S6B	lb.	.43	.44
Plio-Tuf G75C	lb.	.53	.54
G85C	lb.	.53	.54
Polyco 220	lb.	.18¼	.19¼

RETARDERS

Dutch Boy Normasal	lb.	—	.46
ESEN	lb.	.35	.37
Harcopol 1183	lb.	.70	.74
Retarder ASA	lb.	—	.57
Retarder PD	lb.	.35	.37
Retarder W	lb.	—	.45
Retardex	lb.	.47	.50

RUBBER SUBSTITUTES

Mineral Rubber

38	ton	38.00	40.00
Black Diamond	ton	38.00	40.00
Byerlyte	ton	47.00	54.00
Gilsonite, Selects (c.l.)	ton	37.00	38.00
Hard Hydrocarbon (dms.)	ton	46.50	48.50
Herron Flake	ton	—	45.00
Pioneer	ton	35.00	46.00

Vulcanized Vegetable Oils (Factice)

Amberex	lb.	.29	.36
Brown	lb.	.1310	.2200
Neophax	lb.	.1570	.2680
White	lb.	.1480	.2520

Miscellaneous Rubber Substitutes

G.B. Asphaltenes	lb.	.06	.06½
Gilsowax B	lb.	09	.11
Resin No. 1098 (drums)	lb.	—	62
No. 1198	lb.	.46¾	.49¾

SOLVENTS

Acetone (dlvd.)	lb.	.10½	.11¾
American Dipentine	gal.	.34½	.70
American Pine Oil	gal.	.86⅜	1.04
Amsco Lactol Spirits (t.c.)	gal.	—	.19
Naphthol Spirits	gal.	—	.19
Mineral Spirits	gal.	—	.17
Rubber Solvent (t.c.)	gal.	—	.18
Solv A (t.c.)	gal.	—	.27½
Solv A-80 (t.c.)	gal.	—	.32½
Solv B (t.c.)	gal.	—	.31
Solv B-90 (t.c.)	gal.	—	.34
Solv D (t.c.)	gal.	—	.32½
Solv E	gal.	—	.31½
Solv F	gal.	—	.32½
Solv F-80	gal.	—	.35½
Special Naphtholite (t.c.)	gal.	—	.18
Special Textile Spirits	gal.	—	.19
Super Naphtholite	gal.	—	.18
Textile Spirits (t.c.)	gal.	—	.19
Amyl Chlorides, Mixed (t.c.l.) (drums)	lb.	.09¼	.10¾
Benzol 90%	gal.	—	.48
Butyl Acetate (t.c.)	lb.	.15	.16
Butyl Alcohol (t.c.)	lb.	.15	.16
Secondary (dlvd.)	lb.	.13	.14
Tertiary (dlvd.)	lb.	.14	.15
Carbon Bisulfide, Tech.	lb.	.05¾	.08½
Carbon Tetrachloride	lb.	.08¾	.09¼
Cosol 1	gal.	.37	.43
Cosol 2	gal.	.42	.48
Cyclohexane	gal.	.70	.72
Cyclohexanone	lb.	.25	.27
Diacetone, Pure (dlvd.)	lb.	.14	.15
Dichlorethyl Ether (dms.)	lb.	.14½	.15
Formal (dms.)	lb.	.30¾	.31¾
Dichloropentane	lb.	.04¼	.14¾
Dicom	gal.	.30	.42
Halowax Oil	lb.	38	41
Heptanes (t.c.)	gal.	.17	.22
Hexalin Cyclohexanol	lb.	.20	.22
Hexanes (t.c.)	gal.	.17	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.52	.59
Ether, Ref. (dlvd.)	lb.	.07	.08
Mersol	gal.	.43	.79
Mesityl Oxide (dlvd.)	lb.	.13½	.14½
Methyl Acetone, Syn (dms., dlvd.)	gal.	.66½	.72¾
Methyl Ethyl Ketone	lb.	.13	.14
Methyl Isobutyl Ketone (dlvd.)	lb.	.15	.16
N-5 Pentane Mix. (t.c.)	gal.	—	.13½
N-6 Hexanes (t.c.)	gal.	—	.14½
N-7 Hexanes (t.c.)	gal.	—	.13½
Penetrell	gal.	.34½	.70
Petrolene (t.c.)	gal.	—	.13125
Picolines, Alpha, Refined	lb.	.44	1.00
Mixed	lb.	—	.34
Proprietary Solvent (dms.)	gal.	.51	.72
Propyl Acetate (t.c., dlvd.)	lb.	—	.10¾
Alcohol (t.c., dlvd.)	lb.	—	.10

SOLVENTS (Cont'd)

PT 150 Pine Solvent (dms.)	gal.	—	.44
Pyridine, Refined	lb.	.95	1.05
Quinoline	lb.	.60	1.45
Rubber Solvent (t.c.)	gal.	—	.16
Rubsol (t.c.)	gal.	—	.11875
Skellysolve B (Hexanes) (t.c.)	gal.	—	.158
C (Heptanes) (t.c.)	gal.	—	.151
E (Octanes) (t.c.)	gal.	—	.165
R (Solvent Naphtha)	gal.	—	.129
Solvent, Crude, Light	gal.	.19	.28
Solvesso 100 (t.c.)	gal.	.33	.37
150 (t.c.)	gal.	.33	.37
Sunny South Dipentine	gal.	.34½	.70
Sunny South Pine Oil	gal.	.86⅜	1.04
Suntac	gal.	.1140	.1600
Toluene (drums)	gal	—	.28
Toluol (t.c.)	gal.	—	.35
Trichlorethane	lb.	.13	.13½
Triglycol Dichloride (dms.)	lb.	.63	.64
Union Thinner 1	gal.	—	.183
3	gal.	—	.183
5	gal.	—	.173
7	gal.	—	.173
2-50-W Hi-Flash	gal	—	.41
Xylol	gal.	.35	.45

STABILIZING AGENTS (for Vinyl Resins)

Advastab No. 21	lb.	—	1.08
Barca 10	lb	—	.80
Barium Stearate	lb.	.37	.42
Basic Silicate White Lead	lb.	.17½	.18½
Bunatak Polymer No 780	lb.	—	.04
No. 5514	lb	—	.35
BVS	lb.	—	.73¾
Calcium Ricinoleate	lb.	—	.48
Cadmium Stearate	lb.	1.40	1.44
Calcium Stearate	lb.	.35	.40
Dutch Boy DS-207	lb.	—	.54
Plumb-O-Sil A	lb.	—	.29¾
B	lb.	—	.31¾
Tribase	lb.	—	.27½
Dythal	lb.	—	.39½
Ferro 120 (dms.)	lb.	.73¼	.83¾
121 (dms.)	lb.	.68	.78
200 (dms.)	lb	1.33	1.43
211 (dms.)	lb.	.65	.75
221 (dms.)	lb.	1.51	1.61
541 (dms.)	lb.	.35½	.45½
541A (dms.)	lb.	.81¾	.91¾
620 (dms.)	lb.	—	.77½
700 (dms.)	lb.	.48¾	.58¾
900 (dms.)	lb.	1.02¾	1.12¾
903 (dms.)	lb.	.65	.75
909 (dms.)	lb.	1.02¾	1.12¾
920	lb.	—	.98
931 (dms.)	lb.	.75¾	.85¾
1820 (dms.)	lb.	.90	1.00
Harshaw 1-V-3	lb.	.43	.58
1-V-4	lb.	.74	.89
2-V-4	lb.	1.04	1.29
2-V-7	lb.	1.19	1.34
2-V-8	lb.	1.40	1.55
5-V-1	lb.	.41	.56
5-V-2	lb.	.44	.59
7-V-1	lb.	.90	1.05
7-V-2	lb.	.95	1.15
8-V-1	lb.	1.18	1.33
9-V-1	lb.	.84	.99
12-V-5	lb.	.90	1.05
128-V-5	lb.	.86	1.01
Lead Stearate, Precip.	lb.	.32	.39
Fused	lb.	—	.37
Lithium Stearate	lb.	.62	.67
Modicol N	lb.	.42	.42½
S	lb.	.30⅞	.31⅜
Sodium Silicates	cwt.	1.00	5.25
Stabelan E	lb.	1.35	1.50
XL	lb.	.55	.65
GL	lb.	1.25	1.40
HR Liquid	lb.	.67	.75
HR Paste	lb.	.85	.95
HR Powder	lb.	.95	1.05
Stabilizer No. 3	lb.	—	1.95
Stabilizer No. 42	lb.	—	.85
Stabilizer No. 52	lb	—	1.95
Stabilizer No. 89X	lb.	—	.75
Stabilizer No. 143	lb	—	.85
Stabilizer BC-12	lb	—	.90
Stabilizer B-5	lb	—	.70
Sodium Silicates	cwt.	1.00	5.25
Stabilizer CH-14	lb	—	.65
Stabilizer CH-20	lb.	—	.65
Stabilizer E6B	lb	—	.95
Stabilizer E-49	lb.	—	.60
Stabilizer E-98	lb.	—	.55
Stabilizer G-1	lb.	1.25	1.40
Stabilizer HR	lb.	.85	.89
Stabilizer ICX	lb.	—	.63
Stabilizer L	lb.	—	.60
Stabilizer OM-10	lb.	—	1.95
Stabilizer OM18	lb.	—	3.25
Stabilizer SN	lb.	—	.48
Stabilizer V-1-N	lb.	—	.43
Stabilizer VL-3	lb.	—	1.00
Stabilizer V-7939	lb	—	60
Staflex OY	lb.	—	1.20
QXMA	lb	—	.70
Staycin 1	lb.	—	.65
Stayrite 10	lb.	.32	.37
P-10	lb.	.39	.44
15	lb.	.53	.57
20	lb	.37	.42
22	lb.	1.40	1.44

STABILIZING AGENTS (Cont'd)

Stayrite 25	lb.	.35	.40
70	lb.	—	.70
80	lb.	—	.70
90	lb.	—	.70
Vanstay L	lb.	.33	.35
H.T.	lb.	.90	.92
S	lb.	.65	.70

STIFFENING AGENTS

Calco S.A.	lb.	.85	.88

SUN CHECKING AGENTS

Allied AA-1144	lb.	.23	.24
AA-1177	lb.	.15½	.16½
Antisol	lb.	—	.23
Antisun (Chipped)	lb.	.15½	.17½
(Slabbed)	lb.	.15	.17
Heliozone	lb.	.26	.27
NBC	lb.	—	1.55
Sonolite 100	lb.	.21	.23
127	lb.	.17	.19
Sunproof	lb.	.30	.31
713	lb.	.25	.26
Improved	lb.	.25	.26
Super	lb.	.40	.41
Jr.	lb.	.20	.21
Tonox	lb.	52	.54

SURFACE ACTIVE AGENTS

Aquarex D	lb.	—	.78
MDL	lb.	—	.33
ME	lb.	—	.94
NS	lb.	—	.60
SMO	lb.	—	.50
WAQ	lb.	—	.25
Emulphor EL-620	lb.	—	.39½
Igepal CO-730	lb.	—	.36
CO-850	lb.	—	.36
CO-880	lb.	—	.36
Igepon CN-42	lb.	—	.25
T-77	lb.	—	.49
Sellogen Gel	lb.	—	.12¾

TACKIFIERS

Arcco 620-32B	lb.	.20	.21
716-30	lb.	.18	.19
1041-21	lb.	.16½	.17½
Galex (drums)	lb.	.15¼	.18
Indopol H-300	gal.	1.00	1.21
Koresin	lb.	—	.95
Liquid Rubber Flux	lb.	—	.14
Nilox (c.l.)	cwt.	—	14.50
Resin V	lb.	—	.23½
Rubtack	lb.	—	.12
Synthe	lb.	—	.24¼
Tackifier 1041-21	lb.	.16½	.17½
Vistac No. 1	gal.	1.00	1.21
A	lb.	.21½	.22¼
Zirex (c.l.)	cwt.	—	14.75

THICKENERS (FOR LATEX)

Alcogum AN-6	lb.	—	.05
AN-10	lb.	—	.08½
Betanol (drams)	lb.	—	.70
Emulsorex No. 5	lb.	—	.35
Good-Rite K-702	lb.	.34½	.35
K-704	lb.	.21	.22
K-705	lb.	.31	.32
K-707	lb.	.18	.19
K-708	lb.	.29	.30
K-710	lb.	.15	.16
Modicol VD	lb.	.13⅞	.14⅜
VE	lb.	.13⅞	.14⅜
Polyco 296 BT	lb.	.15	.16
296-N	lb.	.15	.16
530	lb.	.15	.16
Propylene Laurate (dms.)	lb.	.57	.67
Sodium Silicate, 41°/1:3.2	cwt.	1.00	2.10

VULCANIZING AGENTS

Selenium

Vandex	lb.	—	6.00

Sulfur

Aero Brand	cwt.	—	2.40
Blackbird (c.l.)	cwt.	—	2.85
Cloud (c.l.)	cwt.	—	2.80
Crystex	lb.	.19½	.23
Darex Dispersed Sulfur	lb.	.14	.16
Devil A (c.l.)	cwt.	—	2.40
Dispersed Sulfur	lb.	.14	.16
Insoluble Sulfur 60	lb.	12½	.13
Ko-Blend IS	lb.	—	.38½
Mist (Wettable) (c.l.)	cwt.	—	4.00
Spider (c.l.)	cwt.	—	2.80
Star (c.l.)	cwt.	—	3.25
Sulfasan R	lb.	—	1.50
Tire (c.l.)	cwt.	—	2.40
Tube (c.l.)	cwt.	—	3.25
Vultac 2	lb.	.47	.74
3	lb.	.51	.78

Tellurium

Telloy	lb.	—	2.50

WETTING AGENTS

Advawet No. 10	lb.	—	.20
No. 33	lb.	—	.48
Aerosol 18	lb.	—	.40
AY	lb.	1.00	1.20
MA 80%	lb.	.67	.72
OT 75% Aqueous	lb.	.63	.68
OT 100%	lb.	1.00	1.20
Alrosol (dms.)	lb.	—	.40
Alrosperse	lb.	—	.18
Areskap 50	lb.	.30	.38
Dry 100	lb.	.60	.72
Aresket 240	lb.	.30	.38
Dry 300	lb.	.60	.72
Aresklene 375	lb.	.42	.57
Armacs	lb.	.28	.77
Arquads	lb.	.24	.60
Emcol 5100 (dms.)	lb.	—	.37
5130 (dms.)	lb.	—	.37
Etho-chemicals	lb.	.26	.58
Kessco E-122 (dms.)	lb.	—	.49
Kreelon 8G (dms.)	lb.	.28	.30
Lecithin	lb.	.13	.17
Modicol N	lb.	.42	.42½
S	lb.	.30⅜	.31⅜
Orvus AB Granules	lb.	.16	.17
Nekal NS	lb.	—	.28

WETTING AGENTS (Cont'd)

Nopco 1187-X	lb.	.15	.16
Parnol	lb.	.13	.18
Selapon Gel	lb.	—	.13
Santomerse D	lb.	.44	.65
S	lb.	.13	.25
Sorapon SF-73	lb.	—	.18
SF-78	lb.	—	.30
Sorbit P	lb.	—	.28
Stablex G	lb.	.50	.70
Tergitol 4 (dms., dlvd.)	lb.	.30	.31
7 (dms., dlvd.)	lb.	.43	.44
O8 (dms., dlvd.)	lb.	.30	.31
P28 (dms., dlvd.)	lb.	.18½	.19
Trenamine W-30	lb.	—	.15
Vultamol	lb.	—	.17½
Wetsit Conc.	lb.	.25	.28

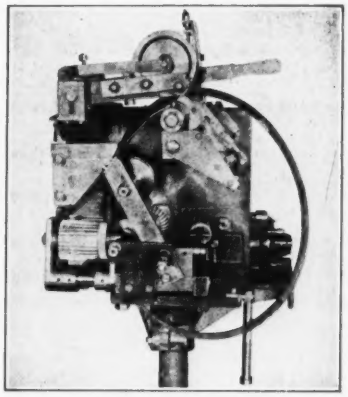
MISCELLANEOUS CHEMICALS

Aquarex G	lb.	—	.21
Aquasperse 30	lb.	—	.11
Arccopel W-18	lb.	—	.18
Copper Inhibitor X-872-L	lb.	—	2.01
D-Tac	lb.	—	.22
2-Ethylhexanol	lb.	.25½	.26½
Fura-Tone Resin 1226	lb.	.41	.43

MISCELLANEOUS CHEMICALS (Cont'd)

Gen-Tac Resin	lb.	—	.42
MODX	tons	.32½	.34½
Nullapon BF-12	lb.	—	.20½
BF-13	lb.	—	.26½
BF-78	lb.	—	.61½
Para Resin 2457	lb.	.04	.04½
2702	lb.	.04	.04½
2718	lb.	.04	.04½
Pigmented Filmite (dlvd.)	lb.	—	.16¾
Resorcin, Tech.	lb.	.77½	.78½
Rio Resin	lb.	.60	.62
Rongalite CX	lb.	—	.22½
Sherosope F	lb.	.17	.17¼
F-445	lb.	.17	.17¼
L	lb.	.18	.18¼
N	lb.	.18	.18¼
T	lb.	.18	.18¼
Sublac Resin PX 5	lb.	.23½	.24½
Sulfasan R	lb.	—	1.50
Synpep	lb.	.54	.60
Thiokol LP-2	lb.	.96	1.06
LP3, LP32, LP33	lb.	.96	1.06
LP8, LP38	lb.	1.25	1.37½
Tysonite	lb.	.24	.24¾
Vanfre	gal.	2.50	3.00

Utility Crimper Type Flipper
for
Truck and Large Balloon Tires



UTILITY MANUFACTURING COMPANY
Cudahy, Wisconsin

Cable Address: UTILITY-MILWAUKEE
Long Distance Phone Call
MILWAUKEE—SHERIDAN 4-7020

ORIGINAL PRODUCERS OF MAGNESIUM SALTS FROM SEA WATER

Magnesium salts from the sea

REGULAR AND SPECIAL GRADES OF
MAGNESIUM
CARBONATES
OXIDES
FOR THE RUBBER INDUSTRY

MARINE MAGNESIUM PRODUCTS DIVISION OF MERCK & CO., INC.

Main Office, Plant and Laboratories
SOUTH SAN FRANCISCO, CALIFORNIA
Distributors:
WHITTAKER, CLARK & DANIELS, INC. 260 West Broadway, New York
CHICAGO: Harry Holland & Son, Inc.
TORONTO: Richardson Agencies, Ltd.
PHILADELPHIA: B. Peltz Co.
PALMER SUPPLIES CO. Cincinnati, Cleveland
G. S. ROBINS & CO. 126 Chouteau Avenue, St. Louis
THE C. P. HALL CO. Akron, Chicago, Los Angeles, Newark

Write for Brochure

NEW SUBSCRIPTION ORDER FORM

RUBBER AGE
250 West 57th Street, New York 19, N. Y.

Enter my *personal* subscription to RUBBER AGE for ☐ 1 year; ☐ 2 years; ☐ 3 years.
☐ Payment Enclosed ☐ Bill Me

RATES

	U. S.	Canada	All Other
1 Yr.	$5.00	$5.50	$6.00
2 Yrs.	7.50	8.50	9.50
3 Yrs.	10.00	11.50	13.00

Payable in U. S. Funds

Name .....
Home Address .....
City ..... **Zone** ..... **State** .....
Company .....
Position .....

CLASSIFIED WANT ADS

RATES:
All Classifications (except Positions Wanted):
10c per word in light face type—Minimum, $3.00
15c per word in bold face type—Minimum, $3.00
Positions Wanted:
$1.00 for 30 words or less; extra words, 5c each.
When Box Number is used, add 5 words to word count

Heading on separate line, $1.00 in light face; $1.20 in bold face.
Advertisements in borders: $15.00 per column inch; maximum, 85 words per inch.
All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.
Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.

Copy for September, 1954, issue must be received by Tuesday, August 31

POSITIONS WANTED

PLANT MANAGER and ENGINEERING TECHNICAL DIRECTOR, wishes to locate with small rubber company manufacturing foam rubber, latex dip goods, and mechanical rubber items. 25 years in the rubber industry. Address Box 124-P, RUBBER AGE.

TECHNICAL SALES REPRESENTATIVE for latex and latex compounds. Eleven years experience in latex foam compounding, research, and production as chief chemist and general manager. Forced to relocate because of rubber allergy. Address Box 146-P, RUBBER AGE.

PLANT MANAGER, Technical Director, Compounder. Thoroughly experienced in compounding, mold design, rubber-to-metal, automotive, aeronautical, refrigerator seals, packings, hydraulic brake cups, etc. Available immediately. Address Box 153-P, RUBBER AGE.

PRODUCTION CHEMIST—TECHNOLOGIST. Experienced in the production of mechanical and sponge molded products, research and development problems, control testing and technical service to customers complaining of pigment production. My technical and production experience afford an unusual background of knowledge applicable to any industry. Address Box 154-P, RUBBER AGE.

RUBBER TECHNOLOGIST—B. S. Chemical Engineering. 10 years in manufacture of GR-S synthetic rubber, supervisory & administrative responsibility, production, technical service & packaging experience. Desire market development, technical service or liaison work. Address Box 159-P, RUBBER AGE.

CHEMIST, B. S.—wishes to contact a small and progressive manufacturer in the following lines: adhesives, pressure-sensitive tapes, coated, laminated, extruded products. If the manufacturer is considering a long range program of development work and business growth, and would treat as important the character as well as the technical efficiency of the applicant chief chemist, then he offers his considerable experience to head up such development program at a salary reasonable for both parties. Address Box 160-P, RUBBER AGE.

LATEX and PLASTIC FOREMAN—experienced in latex and plastic dipping and finishing, also latex and plastic development. Can relocate. Address Box 161-P, RUBBER AGE.

SUPERINTENDENT—CHEMIST wants better opportunity for advancement. Broad practical and technical experience manufacturing mechanical and sponge rubber products. Capable as Production Manager or Technical Director. Educated as Chemical Engineer, trained with large organization as development engineer for products and processes. Address Box 165-P, RUBBER AGE.

FOOTWEAR DESIGNER and pattern man experienced on canvas, latex and rubber footwear wishes to locate with progressive company. Fifteen years in the rubber industry. Address Box 172-P, RUBBER AGE.

RUBBER TECHNICIAN, with over 30 years experience in all phases of rubber manufacturing procedure, including compounding, milling, calendering, molding and extruding hard and soft rubber parts, sponge rubber and some plastics. Desires connection with reliable small or medium sized plant as manager or development engineer. Eastern location preferred. Address Box 174-P, RUBBER AGE.

CHEMIST — CHEMICAL ENGINEERS
"Positions with the better firms"
An active, confidential service!
Interview at your convenience!
"Many Junior Positions"
Call, write, or wire:—GLADYS HUNTING (Consultant)
DRAKE PERSONNEL, INC.
7 W. Madison St., Chicago 2, Ill., FI 6-2107

HELP WANTED

RUBBER CHEMISTS

Requirements: Degree in Chemistry or Chemical Engineering. Up to 5 years' experience in rubber compounding, development or production.

Advantages: Well equipped laboratory, progressive company, Eastern location, contacts with customer, sales and manufacturing departments.

Write giving age, experience and education. Replies held confidential. Employees know of this ad.

Address Box 110-W, RUBBER AGE.

RUBBER COMPOUNDING

RESEARCH

Excellent opportunity for man in rubber and carbon black research compounding. Experience desirable. Salary commensurate with training and experience.

Employee Relations Manager
Research & Development Department

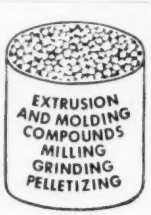
PHILLIPS PETROLEUM COMPANY
Bartlesville, Oklahoma

RUBBER CHEMIST who has 3 to 5 years experience in sponge and/or latex coatings and/or foam to take charge of development and control of rubber operations in a large Southern textile concern. Salary commensurate with experience. Address Box 148-W, RUBBER AGE.

WANTED: A PURCHASING AGENT for small Midwest rubber company. Must have thorough knowledge of stampings, forgings, castings, screw machine products, molds, jigs and fixtures as well as rubber manufacturing materials. Applicant should be able to negotiate blueprint changes, price and follow-up of same. Address Box 150-W, RUBBER AGE.

RUBBER COMPOUNDER
Compounder with minimum experience of five years in either belting, hose, tires or molded rubber goods. Must be capable of developing new formulas and production follow-up on mixing, extrusion and calendering. Write: GATES RUBBER COMPANY, Denver, Colo.

SCRAP **PLASTICS:** POLYETHYLENE • VINYL • STYRENE ACETATE • BUTYRATE
RUBBER: UNCURED COMPOUNDS • SCORCHED STOCKS
ALL TYPES OF FACTORY WASTE FOR RECLAIMING PURPOSES
ROTEX RUBBER COMPANY, INC.
1-23 JABEZ ST. NEWARK 5, N. J. TEL. MARKET 4-4444



HELP WANTED—Continued

SOLVENT CEMENT CHEMIST

Excellent opportunity for development chemist experienced with solvent type rubber adhesives. Small growing Eastern concern. Address Box 162-W, RUBBER AGE.

LATEX CHEMIST

Well established AAA-1 firm has exceptional opening for development chemist experienced in natural and synthetic latices. Kindly state age, education and experience. Address Box 164-W, RUBBER AGE.

CHIEF COMPOUNDING CHEMIST

Prefer individual with experience in mechanical and extruded rubber. Floor experience in milling and extruding preferred. Position in Midwest with private firm. Our employees know of this ad. Address Box 167-W, RUBBER AGE.

ELECTRICAL ENGINEER

Rubber experience preferred in plant equipment and electronics. Midwest location, private firm. Our employees know of this ad. Address Box 168-W, RUBBER AGE.

PRODUCT COST MANAGER

Prefer individual with experience in mechanical and extruded rubber goods. Must be an idea man to help in reducing costs. Position in Midwest with private firm. Our employees know of this ad. Address Box 169-W, RUBBER AGE.

TECHNICAL DIRECTOR

Prefer individual with Ph.D. and mechanical and extruded rubber experience. Position in Midwest with private firm. Our employees know of this ad. Address Box 170-W, RUBBER AGE.

LATEX FOAM CHEMIST—to take full charge of compounding, control and development in modern medium-sized latex foam plant in East. Permanent opportunity for an alert, capable executive. Compensation commensurate with experience. Interest considered after competence is proven. All replies confidential. Our organization knows of this ad. Address Box 171-W, RUBBER AGE.

RUBBER COMPOUNDER

Established New England manufacturer of molded mechanical goods desires rubber technologist acquainted with broad field of synthetic elastomers. B.S. degree required with three years minimum in compounding field. Should be capable of follow-up from production mixing through inspection. A combination of initiative and common sense essential. Send photograph along with resume of experience and salary expected. Address Box 163-W, RUBBER AGE.

RUBBER COMPOUNDER wanted. Position available for an experienced rubber heel and sole compounder in medium sized plant. Must have degree and several years experience in rubber heel and sole industry. Direct all applications to the attention of Mr. Dale A. Dougherty, Comptroller, O'SULLIVAN RUBBER CORPORATION, Winchester, Virginia.

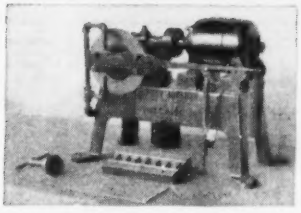
softeners and plasticizers
for rubber from the pine tree

ROSIN OIL • PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" Booklet

NATIONAL ROSIN OIL PRODUCTS, Inc.
Americas Bldg., Rockefeller Center, 1270 Ave. of the Americas, New York 20
Refinery Savannah, Ga. • Branches in Principal Cities
PIONEERS OF THE INDUSTRY

RMP ANTIMONY
• ATTRACTIVE
• NON-DETERIORATING
for RED RUBBER
RARE METAL PRODUCTS CO.
ATGLEN, PA.

TESTED IS TRUSTED



DUPONT ABRADER
One of the many *Scott Testers for "World-Standard" testing of rubber, textiles, paper, plastics, wire, plywood, up to 1 ton tensile.

SCOTT TESTERS
*Trademark
SCOTT TESTERS, INC.
85 Blackstone St., Providence, R. I.

LA GOMA
Monthly Technical Journal
The First Rubber Journal in Spain
Founded: January, 1929
Founder, owner, director and administrator:
Juan Blanch Guerrero
Calle de Moncada, 4, tienda, Barcelona, Spain
Annual Subscription:

Spain	100 pesetas
Foreign	125 pesetas

Lowest Priced
WATERGROUND MICA
Our White and Biotite Waterground Micas have been preferred in the Rubber Industry for years.
Biotite Waterground Mica is the lowest priced WATER-GROUND Mica on the market.
The English Mica Co.
STERLING BUILDING • STAMFORD, CONN.

Hakuenka — an ultra-fine colloidal calcium carbonate — is steadily increasing in use the world over.
HAKUENKA
Special attention to Export Trade
SHIRAISHI KOGYO KAISHA, LTD.
Kitahama, Osaka, Japan

Directory of CONSULTANTS

R. R. OLIN LABORATORIES
Rubber Technologist—Development and research in Natural Rubber, Synthetic Rubber and Plastics. Also chemicals and compounding materials used with these materials.
P.O. Box 372 RA, Akron 9, Ohio

SOUTH FLORIDA TEST SERVICE
(Established 1931)
Corrosion, weathering and sunlight tests. Four locations in Southern Florida for inland, salt atmospheric, tidewater and total immersion exposure tests.
4201 N. W. 7th St., Miami, Florida

PHILIP TUCKER GIDLEY
Consulting Technologist—Research, product development, formulas, factory plans, engineering, chemical and physical testing.
Fairhaven, Massachusetts

HALE AND KULLGREN, INC.
Specialists in Process and Plants for Rubber and Plastics
A Complete Engineering Service; including: Economic Surveys; Process Design; Installation; Contracting and Operation.
613 E. Tallmadge Ave., Akron 10, Ohio

101 Successful Years

Engineered Application of Heat in Continuous Materials Handling Systems

INDUSTRIAL OVENS, INC.
13825 TRISKETT ROAD, CLEVELAND 11, OHIO

MIXING
To Your Specification
K. B. C. INDUSTRIES, INC. NEW HAVEN, CONN.
881 State St. Tel: State 7-5662
Otto J. Lang, General Manager

They'll--
QUICKLY PAY FOR THEMSELVES
--in your plant
- HOLMES ROTARY STOCK CUTTER
- HOLMES HYDRAULIC PRESSES
- HOLMES CRUDE RUBBER BALE CUTTER
- HOLMES HYDRAULIC PUMPING UNIT
- HOLMES SPONGE RUBBER VULCANIZING PRESS

Write for Details
Stanley H. HOLMES Company
Since 1901
3300 WEST LAKE STREET • CHICAGO 12, ILLINOIS

Gaps in your technical library?

Looking for one, convenient, source for *all* books dealing with rubber?

For complete service on *any* book* on rubber, place your order with the

Book Department
RUBBER AGE
250 West 57th St., New York 19, N. Y.

**a listing of available books on rubber will be furnished on request.*

BUSINESS OPPORTUNITIES

EXCEPTIONAL OPPORTUNITY: Salesmen or distributors now calling on rubber manufacturers. Exclusive process makes time saving basic product. Good commissions and repeat business. Address Box 147-B, RUBBER AGE.

RUBBER PLANT HAS OPEN TIME AVAILABLE. It is completely equipped to manufacture mechanical rubber parts, also some type plastics. Personnel capable developing intricate formulas. Interested in volume only. Located about 25 miles from New York City. Address Box 155-B, RUBBER AGE.

10,000 sq. ft., Bridgeport-New Haven area. Ideal for rubber or plastics. Concrete and brick, one-story building, now equipped and manufacturing plastics. Formerly rubber. High-pressure boiler, ample free cooling water, separate office building, 6 acres land, perfect for expansion. Low taxes, excellent labor situation, no State income taxes. Present equipment includes mills, punches, cooling tables and all other equipment needed for operation of a plastic plant. Owner willing to sell with or without equipment. THE BEAZLEY COMPANY, 70 Elm St., New Haven, Conn. LOcust 2-9801.

CUSTOM MIXING, GRINDING and DISPERSION. Production time available on Rotary Cutters, Colloid Mills and explosion-proof Churns with attached filtering mediums. At your service—the technical know-how and completely equipped control laboratory. ADHESIVES & COATING SPECIALTIES, INC., Bldg. #22, 410 Frelinghuysen Ave., Newark 5, N. J.

RUBBER PLANT FOR SALE
Well established Mid Western company with fully equipped factory. Large backlog of unfilled, profitable automotive orders.
Sacrifice less than $50,000.
Will consider working partner.
Address Box 157-B, RUBBER AGE

DETROIT MANUFACTURER'S AGENT desires mechanical rubber account capable of volume automotive, etc., production. Has valuable contacts established over 15 years. Write Box 166-B, RUBBER AGE.

RUBBER MOLDS
I will invest up to $5,000 in rubber molds for the manufacture of any item which will stand careful scrutiny. GEORGE B. FARWELL, 1045 Sonoma Ave., Menlo Park, Calif.

Leading long established manufacturer wants representatives to handle wide line of industrial tapes. All replies confidential. Most United States open in this expansion move. Address Box 173-B, RUBBER AGE.

BLACK
Master Batching
Mixing of all kinds
BESTREAD PRODUCTS CO. STOUGHTON, MASS.

White Colors
MIXING AND CALENDERING
Non-Black Compounds to your specifications
A B C RUBBER CO.
1451 South Sangamon St. Chicago 8, Illinois
Telephone TAylor 9-0644

Custom Mixing
RUBBER-PLASTICS
We do milling and compounding of all types—black or color—master batches
All mixing done under careful supervision and laboratory control.
Phone: Butler 9-0400

Pequanoc Rubber Co.
MANUFACTURERS OF RECLAIMED RUBBER
MAIN SALES OFFICE and FACTORY, BUTLER, N. J.

EQUIPMENT WANTED

WANT Scott Tester, used, good condition. Give full details. Address Box 131-E, RUBBER AGE.

We buy all kinds of molds for motor car parts, mats, heels, household goods, also grommet placing machines, hose branding machines in good condition. Send replies with full details. Address Box 140-E, RUBBER AGE.

WILL PURCHASE FOR CASH: 1—60 inch Mill with drive; 1—72 inch x 14 foot Vulcanizer; 1—Rubber Band Cutter (Rotary); 1—Bale Cutter; 1—#2 Royal Extruder. Equipment must be in first class condition, available for inspection. Address Box 149-E, RUBBER AGE.

WANTED: One used 8" extruder, without motor. Must be in good condition. No dealers, please. Address Box 156-E, RUBBER AGE.

WANTED: Rubber machinery including Banbury mixers, heavy duty mixers, calenders, rubber rolls and mixers, extruders, grinders and cutters, hydraulic equipment, rotary and vacuum shelf dryers, injection molding machines. Will consider now operating or shut down plant. P. O. Box 1351, Church Street Station, New York 8, N. Y.

WANTED: Rubber mills, calenders, mixers, Banbury mixers, extruders, grinders, cutters, hydraulic presses, injection molding machines. Consolidated Products Co. Inc., 70 Bloomfield St., Hoboken, N. J.

EQUIPMENT FOR SALE

USED EQUIPMENT WANTED

One hydraulic press—42" x 42" steam platens, 36" ram—2,000 lbs. pressure—1000 tons—10 openings.

EQUIPMENT FOR SALE

One 60" x 22" Farrel-Birmingham mill—125 HP motor and drive—excellent condition.

Address Box 152-S, RUBBER AGE.

Hydraulic presses and pumps rebuilt, repaired. New presses from laboratory up to 1000 tons. Pumping units up to 10,000 p.s.i., all capacities. CLIFTON HYDRAULIC PRESS CO., 290 Alwood Rd., Clifton, New Jersey.

EVEREADY has calenders, extruders, mixers, mills and other equipment. Contact EVEREADY for listings. EVEREADY SUPPLY COMPANY, 805 Housatonic Ave., Bridgeport, Conn.

FOR SALE: One Adamson 20" x 16" 2-opening hydraulic press, 14" ram. One 18" x 54" 3-roll calender. One 22" x 60" rubber mill. Two Baker-Perkins vacuum mixers, 100 and 150 gallons. Also vulcanizers, Banbury mixers, extruders, etc. CHEMICAL & PROCESS MACHINERY CORP., 146 Grand St., New York 13, N. Y.

HYDRAULIC PRESSES

1—Erie Belt Press, 4242 Tons, 2—8" openings, 18'-0" x 52" Steel Steam Platens, 6 rams—30" diam. x 16" stroke.
1—Birdsboro, 2000 Tons, down-acting ram, 34" dia. x 14" stroke, 48" DLO, 42" x 42" bed area.
1—HPM, 750 Tons, down-acting, ram, 28" dia. x 42" stroke, 72" DLO, 59" x 44" bed area, MD, low and high pressure pumps and accumulator system.
1—Clearing, 500/1500 Tons, completely self-contained with controls for manual or automatic operation, suitable for compression and injection molding.
1—Farrel, 393 Tons, 48" x 48" steam platens, 2—15" openings, 4 rams, 10" diam. x 24" stroke, approx. 15" per opening.
1—Baldwin-Southwark, 400 Tons, slab-side, 30" x 30" Steel Steam Platens, 23" DLO, ram 21" x 17" stroke.
1—Baldwin-Southwark, 200 Tons, 3 Opening, 20" x 20" Steel Steam Platens, Ram 12" x 20" Stroke, 3500 PSI.
1—Southwark, 200 Tons, 2-Opening, 30" x 30" Steel Steam Platens, Ram 14" x 14" Stroke.
1—Thropp, 150 Tons, 36" x 36" Steel Steam Platens, 15" DLO, Ram 14" x 12" Stroke.
1—Watson-Stillman, 100 Tons, down-acting ram, 11½" x 9¼" x 6" stroke, 22" x 20" bed, 24" DLO, self-contained, 15 HP MD Vickers Pump Unit PRACTICALLY NEW.
1—Watson-Stillman, 100 Tons, 11¾" x 12" platens, 22½" DLO, ram—8" dia. x 15" stroke, complete with 3 HP MD Pump.
1—HPM, 100 Tons, 18" x 18" platen area, ram—8" dia. x 18" stroke, 30" DLO; Steel Cylinder—4000 PSI.
2—Burroughs, 75 Tons, down-acting, 17½" x 17" electric-heated platens, 13½" DLO, ram—8" dia. x 10" stroke, complete with 7½ HP MD Oilgear Pump.
1—HPM, 35 Tons, down-acting ram, 6" diam. x 6" stroke, 15" DLO, 12" x 6" bed area, self-contained.
1—Northern, 20 Tons, Model 20-K, 18" x 12" bed, 8" throat, 12" DLO, 12" stroke, 5 HP MD pump, controls.
1—Industo Laboratory Press, 12 Tons, Hand Operated, 8" x 8" electrically heated platens. NEW.

INJECTION MOLDING MACHINES

1—Plasticor Vertical 2 oz., Electric Heated, Hand Operated.
1—HPM Horizontal Model 54, 2 oz., 22 Ton Clamp, 12 Ton Injection, Manual Control, Oil Heated.
2—HPM Model 200-H, 9 oz., 200 Ton Clamp, 31 Ton Injection, Electrically Heated, Full Controls, Excellent Condition, In Operation.
2—Impco Model VF-822A, 22 oz., 350 Ton Clamp, 100 Ton Injection, Electrically Heated, Full Controls, Excellent Condition. In operation.
Also: Plastics & Rubber Extruders, Mills, Mixers, Grinders, Injection Molding Machines, Pumps, Valves, Platens, etc.

JOHNSON MACHINERY COMPANY
683-R Frelinghuysen Avenue Newark 5, New Jersey
BIgelow 8-2500
WHAT HAVE YOU FOR SALE? WHAT ARE YOU LOOKING FOR?

STEEL CALENDER STOCK SHELLS

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars.

4", 5", 6", 8", 10", 12", 15", 20" and 24" diameters. Any length.

Also Special Trucks (Leaf Type) Racks, Tables and Jigs Used in manufacturing rubber and plastic products.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

NATIONAL SHERARDIZING & MACHINE CO.

AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS

858 Windsor St., Hartford, Conn.
Representatives: Akron New York

HOWE MACHINERY CO., INC.
30 Gregory Avenue. Passaic, N. J.
DESIGNERS & BUILDERS
OF "V" BELT MANUFACTURING EQUIPMENT
Cord Latexing, expanding mandrels, automatic cutting, skiving, flipping and roll drive wrapping machines.
ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT
Call or Write

KAUTSCHUK UND GUMMI

Official Journal of the German Society of Rubber Chemists and Technologists (Deutsche Kautschuk-Gesellschaft e.V.) the most quoted and authoritative German Rubber Journal.

KAUTSCHUK UND GUMMI promotes international exchange of ideas concerning economic, technical and scientific problems involved in the different phases of the manufacture of rubber and asbestos products. Business experts and authorities in science and technology supply facts, opinions and research results. Reports and information from the industry's various associations are included.

KAUTSCHUK UND GUMMI is an excellent advertising medium which speaks to just those firms in the import and export trade to whom you want to speak. Specimen copy and advertising rates on application to the publishers.

KAUTSCHUK UND GUMMI
Berlin - Borsigwalde • Frankfurt am Main

MICA WATER-GROUND "At Its Best"

Every rubber manufacturer using Water-Ground Mica should be using "CONCORD" because:

1—It is ground exclusively from a clean, white Muscovite Mica scrap imported from India and Africa.

2—It is whiter and purer.

3—It is strictly competitive in price.

Send for samples and prices

CONCORD MICA CORPORATION
27 Crescent Street Penacook, N. H.

EQUIPMENT FOR SALE—Continued

FOR SALE—Complete #3 Banbury, with motor and controls, newly rebuilt. Also have #9, #3, and #11 rebuilt bodies, with door and cylinder, available for sale or interchange. Write INTERSTATE WELDING SERVICE, Specialists in Banbury Mixer Rebuilding. Offices, Metropolitan Building, Akron 8, Ohio.

SAVE WITH GUARANTEED REBUILT EQUIPMENT: Hydraulic Presses: 2 New R.D Wood 500 ton 54" x 26" platen 42" x 37", 20" ram, 475 tons; 2—7 opening 27" x 27", 18" ram, 565 tons; 24" x 24", 12" ram, 170 tons; 24" x 20", 10" ram, 118 tons; 20" x 20", 10" ram, 118 tons; 20" x 20", 10" ram, 200 tons; 30" x 20", 8" ram, 75 tons; 24" x 20", 8" ram, 75 tons; 14" x 14", 8" rams, 75 tons; 15" x 15", 8" ram, 75 tons; 2—19" x 24", 10" rams, 78 tons; 12" x 12", 6½" ram, 50 tons; 14" x 14", 8" ram, 50 tons; 8" x 9½", 4½" rams, 20 tons; 16" x 16", 3½" rams, 12 tons; PREFORM PRESS: Colton 5½ T. Reeves Drive and Motor, Late type Stokes Model T; LABORATORY PRESSES: Carver & Watson Stillman Units; NEW UNIVERSAL DUAL PUMPING UNITS: 3—15 HP; NEW LABORATORY MILLS AND CALENDERS; EXTRUDER: Modern Plastic, late type 3½"; ACCUMULATOR: HPM 6" ram, 2500#, also Mixers, Vulcanizers, Injection Molding Machines, etc. Universal Hydraulic Machinery Co., Inc., 285 Hudson Street, New York 13, N. Y.

RUBBER & PLASTIC MACHINERY

Hydraulic presses, calenders, mills, extruders, Banburys, 8x16" modern cabinet base mill complete; Twin 45" McNeil Presses; New Waldron Dip unit immediately available; New Vulcanizers, all sizes. Let us quote to suit your needs.

SUAM RUBBER MACHINERY CO.

P.O. Box 529, Akron 9, Ohio — Phone Akron Swandale 4-2177

USED MACHINERY
FOR SALE

1—Ambaco Model 3A Continuous Baler.
2—Thropp 2-roll Rubber Mills, 18"x50".
1—6'x14' Vulcanizer 90 psi ASME
1—Adamson Vulcanizer, 2' x 12' with quick opening door.
1—J. P. Devine Double Door Vacuum Shelf Dryer, 13 Shelves.
1—Paul O. Abbe #2 Master Rotary Cutter with Ball Bearings.
1—Welding Engr. Stainless Steel #2 Extruder.
14—Baker Perkins Steel Jacketed Mixers 100 gals. type 15 JIM 2. Late Type Construction.
10—Buffovak Single Door Vacuum Shelf Dryers, 20 Shelves.
1—Spadone Rubber Bale Cutter with 29" Knife.

WE ARE INTERESTED IN PURCHASING ALL TYPES OF RUBBER machinery consisting of mills, Banbury mixers, extruders, calenders, vulcanizers etc. and also complete plants.

R.GELB & SONS Inc.
STATE HIGHWAY No.29, UNION, N.J.
UNIONVILLE-2-4900

BREWSTER MACHINE CO.
New and Rebuilt Rubber Mill Machinery
Write or call JIM BROWN
349 E. Exchange St., Akron 4, Ohio, FR 6-2911

W & P 100 gal. double arm jacketed mixer, sigma blades; B-P #14 JEM 50 gal. 50 HP. Double arm jacketed vacuum Mixer, sigma blades; Kux model 25 Rotary Pellet Presses, 21 and 25 punch. Large stock steel and stainless steel kettles and tanks. PERRY EQUIPMENT CORP., 1409 N. 6th Street, Philadelphia 22, Pa.

SUPERIOR HAS:
60" x 22" x 20" VAUGHN RUBBER MILL: 14" necks, top caps, heavy duty; Thropp brake, spott reducer 7:1; 125 HP 3/60/440 V; 705 RPM induction motor, electrical controls; in very good condition. 54" x 18" FARREL-BIRMINGHAM 3-ROLL CALENDER: 12" necks complete with gear reduction unit and motor, excellent. 54" x 16" x 16" FARREL-BIRMINGHAM MILL: 50 HP motor; rolls cored for cooling, reduction unit; 8" hydraulic lift tables (3) & 36" x 36" hydraulic press, 6 openings.
SUPERIOR MACHINE TOOL, 803 Housatonic Avenue, BRIDGEPORT, CONNECTICUT, Tel: EDison 4-9471

BUYING-SELLING — All kinds of *used* machinery for the Rubber and Allied Industries.

OFFERING NEW MACHINERY — Hydraulic Presses, Laboratory Mills and Presses, Sponge Rubber Vulcanizing Presses, Drilled Steel Steam Platens, Rubber Bale Cutters guillotine type, Vulcanizers with quick opening doors, etc.

HIGH EFFICIENCY IN QUALITY, PRICE AND DELIVERY TIME
ERIC BONWITT — 431 S. Dearborn Street — Chicago 5, Ill.

GOOD USED MACHINERY "Our 37th Year"

1—Farrel-Birmingham 32" x 92" inverted-L, 4-roll calender, reduction drive, D. C. varispeed motor.
1—Adamson 5' x 28' vulcanizer, quick-opening door, ASME; 1—5' x 12' quick-opening door, 125 psi.
1—Royle #4 extruder, motor driven.
1—6" x 12" laboratory mill, mill.
1—Ball & Jewell #2 rotary cutter, 15 HP motor.
3—#28 Devine vacuum shelf dryers, 19—59" x 78" shelves, complete.
1—Farrel-Birmingham 6" x 13" 3-roll calender.
4—Hymac 150-ton 18" x 18" hydraulic presses, electrically heated platens, 9" diameter rams.
1—Farrel-Birmingham 20" x 22" x 60" mill, top cap frame, Falk reduction drive, 100 HP motor.
2—Farrel-Birmingham 16" x 42" mills with reduction drive and 100 HP motor.

Also other sizes Hydraulic Presses, Tubers, Banbury Mixers, Mills, Vulcanizers, Calenders, Pellet Presses, Cutters.

WANTED: Your Surplus Rubber Machinery

CONSOLIDATED PRODUCTS COMPANY, INC.
70 Bloomfield St., Hoboken, N.J.
Hoboken 3-4425 — N. Y. Tel: BArclay 7-0600

NEW and REBUILT MACHINERY
SINCE 1891
L. ALBERT & SON
Trenton, N. J. — Akron, O. — Chicago, Ill. — Los Angeles, Calif.

WILLIAM TAPPER
USED RUBBER WORKING MACHINERY

18" x 52", 3-roll Farrel calender ● 18" x 20" x 30" Farrel refiner mill ● 16" x 48" rubber mills ● 22" x 60" F-B mill ● 32" x 32" press, slab side, 24" dia. ram, 8 openings.

Cash for your surplus equipment — Monthly bulletin sent upon request

30 South Broadway, Yonkers, N. Y.

PHONE: YONKERS 3-7455
CABLE: WILTAPPER YONKERS, N. Y.

REBUILT MACHINERY for RUBBER and PLASTICS

Mills, mixers, hydraulic presses, calenders. With over 40 years' experience, we rebuild them right and sell them right. Also, list your surplus equipment with us and convert it into cash.

BOLLING AND SON
3190 East 65th St., Cleveland 27, Ohio
MIchigan 1-2850

INDEX TO ADVERTISERS

A

ABC Rubber Co. 762
Accurate Steel Rule Die Manufacturers 621
Adamson United Co. —
Adhesive Products Corp. 751
Aetna-Standard Engineering Co. 629
Akron Equipment Co. 736
Albert, L., & Son 764
Alco Oil & Chemical Corp. 747
American Cyanamid Co.
Intermediate & Rubber Chemicals Dept. 651
Pigments Division 642
American Resinous Chemicals Corp. —
American Zinc Sales Company —
Ames Co., B. C. —
Argus Chemical Laboratory 751
Atlas Electric Devices Co. —

B

Bestread Products Co. 762
Binney & Smith Co. Insert following 708
Black Rock Manufacturing Co. 747
Bolling & Son 764
Bolling, Stewart, & Company, Inc. 753
Bonwitt, Eric 764
Bridgwater Machine Co., The 665
Brockton Cutting & Die Machine Co. 739
Brookfield Engineering Lab, Inc. —
Brooklyn Color Works, Inc. —
Brown Co. 672

C

Cabot, Godfrey L., Inc. 653, Back Cover
Carey, Philip, Manufacturing Co. —
Carter Bell Mfg. Co. o38
Cary Chemicals, Inc. 620
Cellusuede Products, Inc. 648
Chemical Publishing Co. 757
CLASSIFIED
ADVERTISING 760, 761, 762, 763, 764
Cleveland Liner & Mfg. Co. 636
Colledge, E. W., General Sales Agent, Inc. —
Columbia-Southern Chemical Corp. 671
Columbian Carbon Co. Insert following 708
Concord Mica Corp. 763
Consolidated Products Co. 763, 764
CONSULTANTS SECTION 762
Continental Carbon Co. Insert following 658
Coulter, James, Machine Co. —
Cumberland Engineering Co., Inc. 638

D

D. P. R., Inc. 753
Dayton Rubber Co. 735
Diamond Alkali Company
Pure Calcium Prod. Div. —
Dow Corning Corp. —
Drake Personnel, Inc. 760
Du Bois Co., Inc. —
du Pont de Nemours, E. I. & Co., Inc.
Rubber Chemicals Div. Second Cover

E

Emery Industries, Inc. 633
English Mica Co. 761
Erie Engine & Mfg. Co. 648
Erie Foundry Company 673
Eveready Supply Co. 763

F

Falk Corp., The 624
Falls Engineering & Machine Co. 669
Farrel-Birmingham Co., Inc. 617, 630
Ferry Machine Co., Inc. —
Fidelity Machine Co., Inc. —
Flightex Fabrics, Inc. 755

G

Gammeter, W. F., Co. 763
Gelb, R., & Sons, Inc. 764
General Latex & Chemical Corp. 743
General Tire & Rubber Co. 640, 641
Genseke Brothers —
Gidley, Philip Tucker 762
Girdler Co.,
Chemicals-Pigments-Metals Div. —
Goodrich, B. F., Chemical Co. 615
Goodyear Tire & Rubber Co.
Chemical Div. 618, 619, 623
Gussett Boiler & Welding, Inc. 663

H

Hale & Kullgren, Inc. 629, 762
Hall, C. P., Co. 654, 749
Hardesty, W. C., Co., Inc. —
Harshaw Chemical Co. —
Harwick Standard Chemical Co. 645
Hercules Powder Company, Inc. —
Hevestex Corporation
Hoggson & Pettis Mfg. Co. 745
Holliston Mills, Inc. —
Holmes, Stanley H., Co. 762
Howe Machinery Co., Inc. 763
Huber, J. M., Corp. 674
Humko Corp., Trendex Div. 749

I

Independent Die & Supply Co. 755
Indoil Chemical Co. —
Industrial Ovens, Inc. 762
Industrial Research Laboratories —
Injection Molders Supply Co. 737
Interstate Welding Service —

J

Johnson Steel & Wire Co., Inc. 650
Johnson Machinery Co. 763

K

K. B. C. Industries, Inc. 762
Kautschuk und Gummi 763
Kennedy—Van Saun Mfg. & Engineering Corp. 627
Koppers Co., Inc. 745

L

La Goma 761
Lambert, E. P., Co. —
Lehmann, J. M., Co., William R. Thropp
& Sons Div. 661
Liquid Carbonic Corp. 733

M

Marbon Corp. 625, 655
Marine Magnesium Products, Division of
Merck & Co., Inc. 759
Maryland Cork Company, Inc. —
Monsanto Chemical Co.
Plastics Division 628, 667
Muehlstein, H. & Co., Inc. 729

N

National Forge and Ordnance Co. 740
National Rosin Oil Products, Inc. 761
National Rubber Machinery Co. —
National Sherardizing & Machine Co. 763
National-Standard Co. 652
Naugatuck Chemical Division
U. S. Rubber Co. 676
Neville Chemical Co. 643
New Jersey Zinc Co. 664

O

Oakes, E. T., Corp. 666
Ohio-Apex Div.
Food Machinery & Chemical Corp. 740
Olin, R. R., Laboratories 762
Oronite Chemical Co. —

P

Pan American-Chemicals Division 639
M. W. Parsons-Plymouth, Inc. 736
Pasadena Hydraulics, Inc. 749
Pennsylvania Industrial Chemical Corp. 637
Pequanoc Rubber Co. 662, 762
Phillips Chemical Co. 616
Pittsburgh Coke & Chemical Co. 647
Polymel Corp. 634
Preventive Maintenance Co. —
Progressive Service Co. —

R

Rare Metal Products Co. 761
Revue Generale du Caoutchouc 757
Rhodia, Inc. 732
Richardson, Sid, Carbon Co. 766
Rotex Rubber Company, Inc. 760
Royle, John, & Sons 755
Rubber Corp. of America 743

S

St. Joseph Lead Co. —
Schulman, A., Inc. Inside Back Cover
Scott Testers, Inc. 761
Sharples Chemicals Inc. 649
Shaw, Francis, & Co., Ltd. —
Shell Oil Co. 657
Shiraishi Kogyo Kaisha, Ltd. 761
Siempelkamp, G., & Co. 644
Simplex Cloth Cutting Machine Co., Inc. 735
Skelly Oil Co., Solvents Div. 626
Snell, Foster D., Inc. 737
South Florida Test Service 762
Southeastern Clay Co. 753
Southern Clays, Inc. —
Spadone Machine Co. 757
Stamford Rubber Supply Co. 757
Stanley Electric Tool Div. 751
Stauffer Chemical Co. 635
Stoner's Ink Co. 765
Suam Rubber Machinery Co. 764
Sun Oil Co. 731

T

Tanney-Costello, Inc. 668
Tapper, William 644, 764
Taylor Instrument Companies —
Taylor-Stiles and Co. 734
Thomaston Mills 739
Thropp, William R., & Sons
Div., J. M. Lehmann Co. 661
Titanium Pigment Corp. 656
Tracerlab Inc. 650
Trade News Service 765
Trendex Div., Humko Corp. 749
Turner Halsey Co. —

U

United Carbon Co. Insert following 630
United Clay Mines Corp. 749
United Engineering & Foundry Co. —
U. S. Rubber Reclaiming Co. —
Universal Hydraulic Machinery Co. 764
Utility Mfg. Co. 759

V

Vanderbilt, R. T., Co. Front Cover
Velsicol Corp. 670

W

Watson-Standard Co. —
Wellington Sears Co. 622
Western Supplies Co. 646
White, J. J., Products Co., Inc. —
Whittaker, Clark & Daniels, Inc. 668
Witco Chemical Co. Insert following 658
Wood, R. D., Co. —

STONER'S SPECIAL MOLD LUBRICANTS

#**45 Emulsion Lubricant.** 35% Silicone oil. Superior heat-resistant lubricant. Keeps molds cleaner than any other lubricant known.

#**956 Silicone Base.** High quality, general purpose lubricant, excellent release, fine finish

#**856** General purpose lubricant. Excellent release, low ash. Keeps molds clean.

#**825** For fine quality goods where finish is critical. Leaves surface mirror-smooth. Non-staining.

Write for samples today.

STONER'S INK COMPANY
QUARRYVILLE, PENNA.

THE **DAILY** GUIDE

This is indispensable to buyers of Rubber

THE TRADE NEWS SERVICE

Established 1915

24 Stone St. **New York 4, N. Y.**

featuring

MARKET REPORTS • RUBBER IMPORTS • STATISTICS

Write for Free Trial Service

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

...held by performance

Keeping a customer is like keeping a bride. A continuous, friendly business relationship requires the assured delivery of top-quality raw materials at prices which offer savings through their use.

TEXAS "E" and ***TEXAS "M" CHANNEL BLACKS*** in natural rubber allows you to reduce your costs while maintaining quality through

Lower price material

Less scorched stock

The Sid Richardson Carbon Co. with its nearby natural resources and extensive production facilities assures your present and future needs.

TEXAS
CHANNEL BLACKS

Sid Richardson
CARBON CO.

FORT WORTH, TEXAS

GENERAL SALES OFFICES
EVANS SAVINGS AND LOAN BUILDING
AKRON 8, OHIO

New York City
53 East 34th St.
Murray Hill 5-8388

Akron, Ohio
790 E. Tallmadge
HEmlock 4-4124

Boston, Mass.
738 Statler Bldg.
Liberty 2-2717

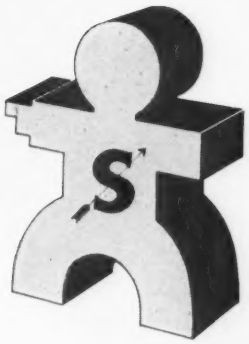
E. St. Louis, Ill.
14th & Converse
BRidge 1-5326

A. Schulman, Inc., Ltd.
Ibex House Minories
LONDON E. C. 3,
ENGLAND
Telephone: Royal 4989

A. Schulman (USA) GmbH
Bolco Building
Hinuberstrasse 18
HANOVER, GERMANY
Telephone: 21551

scrap rubber

plastics



crude rubber

hard rubber dust

A. Schulman Inc.

our 25th year

Worldwide....
CABOT
THERMAL
CARBON BLACKS
for Natural Rubber Tubes Mechanical and Extruded Goods . . .
A Complete Range
Sterling® FT
FINE THERMAL
Sterling® MT
MEDIUM THERMAL
Sterling® MT Non-Staining
MEDIUM THERMAL NON-STAINING
Contact your nearest Cabot agent for details
GODFREY L. CABOT, INC.
BOSTON, MASS.
CABOT

38th Year

SEPTEMBER, 1954

RUBBER AGE

USE

Rio Resin

for

HEAT RESISTANCE

Add it to GR-S or Neoprene
Compounds for Retention of
Elongation in High Temperature Service.

OZONE PROTECTION

Keep Cables from Corona
Cutting by Including it
in the Jacket Formulation.

Add 5 Parts or More per 100 of Polymer

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.